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The Impact of Individualized Structured Reading Intervention on High School Students in Special Education: An Action Research Study

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THE IMPACT OF INDIVIDUALIZED STRUCTURED READING INTERVENTION ON HIGH SCHOOL STUDENTS IN SPECIAL EDUCATION: AN ACTION RESEARCH STUDY

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DEDICATION

I dedicate this dissertation to my Papa, Don Hutson.

Your lifetime of hard work provided for my pursuit of higher education.

I would not have been able to do this without you.

Thank you for everything; this is for you.

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ABSTRACT

Reading skills comprise the following three categories: decoding, fluency, and comprehension. All three of these skills are necessary for students to become successful readers in and out of academic settings. Many students in special education read far below their grade level; difficulty reading is particularly challenging for such students because, in addition to limiting academic success, under-developed reading skills compromise students' academic and functional independence. This study aimed to examine how a structured, individualized reading intervention may help high school students in special education – students who have been diagnosed with one specific disability or a combination of approved disabilities – improve their reading skills. Data collected included students' Lexile levels, overall grade point averages, English grades, and overall attitudes about reading and themselves as readers. The students then received the reading intervention, System 44™, for 18 weeks. At the end of the intervention, students were re-evaluated using the same data collection instruments. The researcher determined the success of the intervention by examining positive changes in student Lexile levels, test results, as well as their attitudes about reading and themselves as readers.

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CHAPTER 1 – INTRODUCTION

Introduction

Reading is essential to students' success both inside and outside of the classroom; "not only does reading serve as the major foundational skill for school-based learning, but reading ability is strongly related to opportunities for academic and vocational success" (Iretor-Oscar, 2014, p. 619). Literacy is commonly understood as the ability to read, write, spell, listen, and speak; of the skills clustered as literacy, reading has the most profound impact on academic success (Yusuf & Enesi, 2012). Reading education is fundamental and begins early in a student's schooling: "The first years of school, particularly kindergarten and 1st grade, are critical for the development of early reading skills that form the building blocks for later literacy" (Palacios, 2017, p. 178). While reading instruction is critical at a young age, some students do not respond to the traditional methods of reading instruction and ultimately fall behind expectations for developing readers. These students demonstrate below-grade-level reading skills on benchmark assessments beginning in early elementary school. Palacios (2017) noted that, by the 4th grade, "approximately one third of children are reading below grade level, limiting their ability to develop content knowledge in other areas" (p. 178).

Due to the large numbers of students reading below grade level, reading intervention programs are extremely prevalent for elementary-school-aged students; however, such interventions are often unsuccessful in closing the achievement gap prior to a student entering high school. Clarke, Paul, Smith, Snowling, and Hulme (2017)

concluded that nearly a quarter of eighth grade students in the United States have not reached grade level reading capabilities which leads to students lack of engagement in literature as well as underachievement in academics. Students who are below their grade level in regard to their reading skills require continued reading intervention programs at the secondary level.

It is important to note that a significant proportion of students in special education have deficits and difficulties in all areas of reading including basic reading skills, reading fluency, reading comprehension, and vocabulary development. As measured by data related to standardized tests, students with disabilities typically score far below the passing rate on reading assessments (Solis, Miciak, Vaughn, & Fletcher, 2014). Academic deficits pertaining to reading affect students in all subject areas and create increased difficulty for students upon graduation from high school.

Poor reading ability limits students' postsecondary education options. An increasing number of students are placed in remedial courses for reading at the college level each year (Boatman & Long, 2018). Below-average reading ability correlates with a student's limited abilities to live and work independently in society. Lower reading abilities correlate with higher levels of poverty and fewer job opportunities (Mathes, 2017). The inability to read at a basic level makes independently completing job applications, filling out leases, and paying bills exceedingly difficult.

The aforementioned consequences of limited reading abilities must be remedied through appropriate reading interventions; "there is empirical evidence to support the notion that students with reading difficulties and reading disabilities can improve their reading ability when provided intensive reading interventions" (Solis et al., 2014, p. 219).

The focus of this action research study was the implementation of a new reading intervention class at Hutson High School[1] solely for students in special education. This class was designed to improve students' reading skills, overall grades, attitudes about reading, and self-perceptions as readers through the implementation of the System 44™ curriculum. The System 44™ curriculum is an individualized reading intervention that has three components, a self-paced online program, a teacher-led small group component, and an individual student reading comprehension component.

Purpose of the Study

The purpose of this study was to determine if structured, individualized reading intervention, when provided to high school students in special education, had a positive impact on the students' reading comprehension. The intervention and curriculum utilized in this study was System 44™. System 44™ aims to improve students reading ability through individualized, self-paced instruction on the computer, small-group instruction facilitated by the teacher, and whole class warm-ups where all students participate. The students receiving this intervention had a variety of diagnosed disabilities including specific learning disabilities, speech impairment, other health impairment, and auditory impairment. The prescribed program, System 44™, focused on students' individual needs, including decoding sounds and words, reading fluency, and reading comprehension.

Significance of the Study

The teacher-researcher served as a part of a district-level committee that gathered and reviewed data of high school students in special education and subsequently

[1] Pseudonym: not real name of research cite

determined the need for a reading intervention program. Based on the decisions of that committee, a new reading intervention class was created at the high school level within the district. This action research study was designed to provide critical data related to determining the effectiveness of the System 44™ curriculum and overall implementation of the reading intervention.

This study also contributed to the academic field of research focused around reading interventions. While, traditionally, a considerable amount of research on the topic of elementary-aged children receiving reading interventions exists, fewer studies have focused on special education students at the high school level, which encompasses the population that was targeted in this study. More recently the topic of reading intervention designed to close the reading gap in high school students has become a focal point in educational research (Taylor & Gordon, 2014). However, relatively few studies have evaluated reading interventions for students in special education at the secondary level. It is imperative for teachers to be able to not only determine the needs of their individual students but meet those needs through successful intervention (Jaaskelainen & Deneen, 2018).

While reading intervention is extremely important, there are several barriers to students receiving the necessary intervention. These barriers derive from the increased academic standards across all areas. Although increased rigor has improved students reading ability overall, it has not decreased the percentage of students who are reading below grade level (Cantrell, Almasi, Rintamaa, & Carter, 2016). Another obstacle is the increased importance placed on standardized testing. This increased rigor, particularly in regard to standardized tests, pressures teachers to increase their students' skill levels in

specific subjects and does not allow time in the curriculum to remediate basic reading skills (Wexler, Reed, Pyle, Mitchell, & Barton, 2015). This action research study counteracted these barriers by providing a designated class period for students to receive reading intervention from a secondary teacher with training in reading instruction. The study also contributed to the growing field of research focused on reading intervention for high school students in special education.

Additionally, this study was significant for the individual students receiving the reading intervention. It aimed at improving reading abilities with the hope that increased reading abilities would lead to improved academic success. Increased reading success leads to higher graduation rates and better preparedness to participate in the global workplace (Taylor & Gordon, 2014). This study also aimed to improve the students' self-esteem by improving their reading abilities. Self-esteem is a combination of many components including academic ability and specifically reading skill (Iretor-Oscar, 2014). It is also difficult for students who have been labeled as struggling to remove that label from their personal views of themselves (Glenn, Ginsberg & King-Watkins, 2018). Without successful reading intervention, students continue to fall behind in reading, leading to increased disengagement and decreased success in school.

Statement of the Problem of Practice

Students with significant reading deficits often do not possess the essential skills needed to decode and comprehend words (Uysal & Bilge 2018). Prior to the advent of the Fundamentals of Reading class, the students at Hutson High School who participated in this research study were not receiving specific reading intervention to address their knowledge gaps. Without the ability to read, these students' ongoing struggles to succeed

in their academic classes lead to frustration, low self-esteem, and, in some cases, behavioral problems. Within this subgroup of students, academic challenges in the area of reading also lead to difficulties outside of the classroom; for example, problems reading and completing job applications lead to difficulty finding employment and, in cases where students are hired, being successful in employment. In other words, reading is an essential skill to be able to be functionally independent in society; prior to intervention, the students who were the subject of this study were neither functioning at reading level nor capable of basic levels of independence.

All high school students in the state of Texas are required to take four years of English: English I, II, III, and IV. This requirement includes all students in special education. Consequently, the students in special education that took part in this research study were simultaneously enrolled in English classes where they were receiving instruction using a modified curriculum. Even with modifications, the design of the English curriculum requires focus on higher-level reading comprehension skills such as inferring, identifying an author's purpose, identifying literary devices, and learning specific writing styles in order to meet the grade-level standards. These traditional English classes do not focus on the basic skills of reading, the primary deficit facing students in this study.

The problem of practice was that students in special education were not receiving appropriate reading intervention to address their knowledge gaps in all aspects of reading. The expectation was for students to complete high-school-level coursework and assessments with reading levels that were profoundly above their current independent reading level. The lack of reading-focused intervention also resulted in students

graduating high school without the reading skills necessary for postsecondary educational settings, employment, and/or independent living.

Research Question

To examine the problem of practice previously stated, this action research study addressed the following research question:

RQ1: What effect will a structured, individualized reading intervention course (System 44™) have on the Lexile levels of high school students receiving special education services?

The following two sub questions were also addressed:

1. What effect will a structured, individualized reading intervention course have on the grades of high school students receiving special education services?
2. How does a students' progression in their reading intervention course relate to their feelings about reading and their overall self-confidence as it pertains to reading?

Lexile Level

The measure used to determine and track students' reading comprehension ability in this action research study was the Lexile Level system. Lexile levels is, "a reading-comprehension level that indicates both the comprehension ability of the student as well as the complexity of a text" (Lexile, n.d.). Using Lexile Levels is a preferable reporting and tracking system because scores are very specific and allow tracking of growth in smaller increments than using a grade-level equivalent for reading comprehension abilities.

Lexile Levels are both beneficial to tracking progress, but also to planning reading lessons and incorporating differentiation into intervention. When implementing reading intervention, it is critical to assign texts that are within the students' independent reading level (Swanson & Wexler, 2017). Providing too challenging text leads to student frustration and does not improve the students reading ability. Lexile levels are beneficial in determining the students' independent reading level and then matching that student with appropriately complex texts (Swanson & Wexler, 2017).

The table below provides Lexile levels and their corresponding grade level. The range in each grade level represents students between the 25^{th} 75^{th} percentiles in each grade.

Table 1.1

Lexile Level to Corresponding Grade Level

Grade	Lexile Level
1	BR to 295
2	170 to 545
3	415 to 760
4	635 to 950
5	770 to 1080
6	885 to 1165
7	925 to 1235
8	985 to 1295

Grade	Lexile Level
9	1040 to 1350
10	1085 to 1400
11 & 12	1130 to 1440

Overview of Methodology

Action research is "any systematic inquiry conducted by teachers…with a vested interest in the teaching and learning process or environment for the purpose of gathering information about how their particular school operates, how they teach, and how their students learn" (Mertler, 2014, p. 4). Action research is different from traditional teaching that does not emphasize thinking about whether such pedagogy is meeting the needs of their students (Mertler, 2014). Teachers using an action research methodology are constantly evaluating whether their methods are effective; if they are not effective, the teacher-researcher needs to develop new methods, immediately implementing those approaches to see if the modifications will prove more effective. Action research aims to improve practice through problem solving, this focus that benefits the teacher-researcher as well as their students (Romero, 2015). The teacher-researcher improves through the process of taking close and repeated looks at specific issues in their classroom while completing the research process to determine if specific solutions were effective. This process, in-turn, benefits the students who are now receiving a higher level of instruction more tailored to their specific needs and challenges. Action research facilitates teacher involvement in improving their practice of teacher through reflection and inquiry (Hughes, 2016).

Action research in education differs from traditional education research because the teacher-researcher conducts a study in his or her own classroom, with his or her individual group of students as subjects. Traditional educational research requires the researcher to enter into a classroom to observe and collect data as an outsider. “Action research is not done ‘to’ or ‘by’ other people; it is research done by particular educators, on their own work, with students and colleagues” (Mertler, 2014, p. 21). Action research is a practice, one that requires continual changing and evolution. It follows a cyclical process of first planning then action and development followed by reflection (Mertler, 2014). Mertler (2014) broke the process of action research into nine steps: identifying the topic, gathering information, doing a literature review, coming up with a research plan, implementing the plan and gathering data, analyzing that data, developing an action plan, sharing and communicating the results, and then reflecting. Action research inherently incorporates elements of reflection and self-evaluation because it requires the teacher who is the researcher, to spend time determining if what they are doing is working and then changing or adapting the method if something is not. Action research may never come to a complete conclusion because teacher researchers constantly aim to improve their instruction through continuous evaluation of their methods (Mertler, 2014). Action research gives the teacher the opportunity to continue to evaluate and make sure their instruction is relevant and reaching as many students as possible. It is easy for a teacher to fall into a pattern, get comfortable with what they are teaching, and resist changing their methods or delivery. This potentially limits the amount subsequent students are learning because the way the material was initially presented – even in a successful class – the teacher may not continue to reach students in subsequent semesters and years.

Implementing an intervention strategy while actively monitoring student's progress in order to alter implementation method not only promised to help improve students reading levels, it provided lesson-to-lesson opportunities to evaluate effectiveness consistently as an educator. Moreover, the study's goal of improving students' reading level promised to benefit them academically in all their classes. This is because reading is a foundational skill necessary to academic success; educational research suggested that any gains in reading level would also help them in all aspects of their life by providing more confidence in their reading skills, which would allow increased levels of independence.

Methodology

This action research study utilized a concurrent mixed methods research design. Mixed methods research design incorporates both qualitative and quantitative data. For this study, collection of qualitative data occurred through a questionnaire in which the students answered questions regarding their attitudes towards reading. The study's quantitative data included the students' Lexile levels as well as their overall grades in all their classes and their English grades specifically. The study was a concurrent design, mixed methods study because the qualitative and quantitate data were collected concurrently at two specific times during the research study.

Data collection followed a pretest-posttest design method. The collection of qualitative data occurred prior to the implementation of the intervention and again, eighteen weeks later, upon completion of the semester-long intervention. To establish a starting point regarding the participants' attitudes towards reading and senses of themselves as writers, students completed a questionnaire prior to the start of the intervention. All participants completed the same questionnaire after the intervention to

determine and identify any effects the intervention had on the students' personal feelings towards reading or towards their self-identification or lack thereof as writers. A similar method was used to collect quantitative data regarding student reading levels and general academic success in another course. Students completed an online assessment that established initial Lexile levels and the teacher-research used the school's data system to obtain each participating student's grades in all classes. In order to identify any immediate student gains, either in Lexile level or in general academic success, this process was completed identically after the intervention period was completed.

Limitations of the Study

While this study's design and methodology were intentional efforts to mitigate potential limitations of the study, limitations still existed within the study. These limitations included the sample size (seven students), the considerable and significant differences regarding students identified as special education students, and the 18-week duration of the study. The study included seven participants, a relatively limited sample size, which decreases the ability to generalize the data to other sample groups. Due to the constraints of action research, this limitation of a small sample size was unavoidable.

Another limitation of the study was that it, did not prove feasible to focus this study solely on students who were diagnosed with the same disability. The sample group for this study included students currently diagnosed with the following disabilities: specific learning disabilities, speech impairments, auditory impairments, and other health impairments. Though the diversity of students in special education in general and this class in particular made it difficult to generalize the results of this study outside of this student group. Robertson, Sobeck, Wynkoop, and Schwartz (2017) stated that while

research proves that research-based interventions on students with disabilities are effective, the ability to generalize the results is unknown due to the variability of disabilities in participants.

Due to the constraints of the intervention schedule and school's master schedule, which was outside of the teacher-researcher's control, the intervention lasted only 18 weeks. Longer intervention would have provided more data and fewer limitations.

Dissertation Overview

This dissertation will contain four additional chapters that will further explain the current literature as well as the research and results. Chapter One gives an overview of the current problem of practice; the chapter highlights the need for a quality and comprehensive reading skills intervention for students in special education at the secondary level and of the implications, this lack of functional intervention has for students even after they have graduated high school. Chapter Two presents a review of relevant literature centered around past research on reading interventions, specifically interventions for students with disabilities. Chapter Three addresses the methodology of this action research study, outlines the reason for the study, and reveals and comments upon the design of the study. The reporting and interpretation of these results in located in Chapter Four. Chapter Five summarizes the action research study and outlines potential implications of the findings.

Definition of Key Terms

Academic reading. Reading that students need to be able to do in school in order to be successful in their classes.

Auditory impairment. "An impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance" (Individuals with Disabilities Education Act [IDEA], n.d.).

Decoding. "The ability to apply your knowledge of letter-sound relationships, including knowledge of letter patterns, to correctly pronounce written words" (Reading Rockets, Word Decoding, n.d.).

Functional literacy. Possessed by a person who can engage in all those activities for which literacy is a requirement for effecting function of his or her group and community and for enabling him or her to continue to use reading, writing, and calculation for his or her own and for the community's development. (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2018).

Lexile level. A reading-comprehension level that indicates both the comprehension ability of the student as well as the complexity of a text; the text is assigned a level also. (Lexile, n.d.).

Reading comprehension. The ability of students to make sense of and meaning from what they are reading (What is Reading Comprehension? 2014).

Reading fluency. The student's ability to read at an appropriate speed while maintaining accuracy and correct expression (Reading Rockets, Fluency, n.d.).

Special education. Specially designed instruction for students with one of 13 qualifying disabilities, provided at no charge to the parent (IDEA, n.d.).

Specific learning disability. "A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may

manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations" (IDEA, n.d.).

Speech impairment. "A communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment, which adversely affects a child's educational performance" (IDEA, n.d.).

CHAPTER 2 – LITERATURE REVIEW

Introduction

The ability to read is critical, both in terms of academic success in high school and in the context of independent living. In high school classes, "students will be asked to read increasingly difficult texts to build domain-specific knowledge (i.e., acquire content knowledge) and to develop and defend diverse perspectives as a means of becoming content area literate" (Vaughn et al., 2015, p. 547). Unfortunately, students with identified disabilities often struggle in the area of reading, which greatly influences their ability to be successful both inside and outside of the classroom (Vaughn & Wanzek, 2014). "Having the ability to read fluently and effectively has the potential to open doors for academic success and economic independence" (Josephs & Jolivette, 2016, p. 39). For students who are struggling readers, often students with diagnosed disabilities, obtaining the aforementioned academic success and independence is much more difficult and unlikely (Josephs & Jolivette, 2016).

The problem of practice for this action research study is that a large number of high school students in special education read at levels far below their academic grade level (Spear-Swerling & Brucker, 2006). Such deficits limit students' academic success in school and complicates their ability to function independently outside of school. Vaughn and Wanzek (2014) found that national data provided a consistent level of poor performance in the area of reading pertaining to students with disabilities as well as low levels of growth in that area. Students with below-grade-level reading abilities are

missing essential skills to be able to decode and comprehend words. Frequently, such students do not receive instruction to fill those knowledge and ability gaps. Students with limited knowledge and limited reading skills, particularly students who are also in special education, often struggle to be successful in their academic classes; in addition to complicating student learning in classes for which reading is essential to learning content, deficits in reading ability can lead to frustration, low self-esteem, and, in some cases, behavioral problems (Learned, 2016). Soureshjani and Noushin (2011) noted, "self-esteem is the result rather than the cause of academic achievement" (p. 1313). Students who fall into the aforementioned category frequently have additional difficulties outside of the classroom including difficulty reading and completing job applications, difficulty procuring and succeeding at independent employment, and difficulty functioning independently in a culture that takes literacy for granted. Reading is an essential skill to be successful in life; however, these students frequently do not currently possess a reading level that allows them to obtain success (Margolis, 1997).

As a nation, reading abilities for students without disabilities are on an incline; unfortunately, reading abilities for students with disabilities are declining as indicated by national tests (Vaughn & Wanzek, 2014). However, in one study, Vaughn and Wanzek (2014) found that the time both groups spent in a reading class was equivalent. The problem was that students with disabilities were not participating in the reading: they were either off-task, out of the room, or waiting for help (Vaughn & Wanzek, 2014). The authors also found that students were given insufficient time to read texts either silently or aloud; furthermore, not enough time was spent working on reading comprehension. In

general, reading interventions at the elementary level are more impactful than those provided at the secondary level (Vaughn & Wanzek, 2014).

This review of literature will examine the following components: 1) key concepts related to this action research study, 2) components of reading, 3) external factors that affect reading achievement, 4) research regarding students' reading achievement at the secondary level, 5) reading intervention research, and 6) the theoretical framework that undergirds this research study.

Key Concepts Related to this Action Research Study

All literature reviewed in this chapter relates to the construct of reading. Reading is a large construct that must be broken down into different variables if one intends to analyze how reading deficits effectively function. The analysis of phonemic awareness, reading fluency, reading comprehension, vocabulary development, and spelling occurred in several studies (Kuhn, Schwanenflugel & Meisinger, 2010; Perfetti & Stafura, 2014; Jeffes, 2015; McCray, Vaughn, & Neal, 2001). The components of reading are closely related to this action research study because the study's reading intervention, System 44™, focuses on the aforementioned reading components. Other variables, including group size, length of intervention, and individualized interventions, are also reviewed in the literature.

While this intervention includes several components of reading including reading fluency, decoding abilities, and reading comprehension, the data collected focused on the area of reading comprehension. When discussing reading fluency, there are many accepted academic definitions, the consensus is that accuracy, automatic, and prosody are all key components in this construct (Kuhn et al., 2010). The concept of reading in

general requires the connection between decoding the words and adding meaning to those words. Proficient reading comprehension and understanding require the student to construct a link between word identification and a comprehension system (Perfetti & Stafura, 2014).

The review of students' attitudes toward reading and self-perceptions as readers occurred in multiple studies; several findings were replicated in this action research study (Jeffes, 2015; McCray et al., 2001). Here, self-worth is an important concept; performance in school can play a large role in a student's concept of self-worth and self-esteem. "Self-esteem is a generalized feeling about the self, and . . . it is the sum of a set of judgments about one's value, worthiness, and competence in various domains" (Emler, 2001, p. 45). Low self-esteem has negative results including depression, suicidal ideation, teen pregnancy, and victimization by others (Emler, 2001). The strongest impact on students' self-esteem is their parents and parenting style. Nonetheless, planned intervention improving reading levels and, in-turn, general levels of academic performance can raise self-esteem (Emler, 2001).

Components of Reading

The literature review analyzed several components of reading. The components analyzed for the purpose of this literature review were external factors that affect reading, reading studies focused on students at the secondary level, past reading intervention studies and implications. This information is important to take into account when choosing an intervention and relevant instructional materials for the classroom.

Vocabulary acquisition affects reading comprehension because, without understanding a mean of a word, a student is unable to glean meaning and understanding

from the text presented to them (Solis, Scammacca, Barth, & Roberts, 2017). Inferencing is the ability of students not only to comprehend the basics of a text, but also to analyze a text and draw their own conclusions (Hamilton, Freed, & Long 2016). There are also several outside factors that affect students' academic performance in the classroom, including reading ability (Giménez, Ortiz, López-Zamora, Sánchez, & Luque, 2017).

Rashid and Brooks (2010) examined literacy levels for students aged 13–19 to see how levels have changed over the past 70 years. Generally, reading ability improved from the years 1948 to 1960, recovering from a previous decline in achievement because of WWII. The researchers had no explanation for a period of no growth from 1960 to 1988. The researchers noted a small increase from 1988–2009 (Rashid & Brooks, 2010). The overall trend showed that over time, excluding war times, literacy levels have improved.

> Reading acquisition is a central challenge in children's developmental trajectories and a key determinant to overall educational success during elementary school. As a result, children who manifest early difficulties in learning to read represent a vulnerable group at high risk of underachievement trajectories throughout childhood and beyond, with long lasting consequences and costs for individuals and societies. (Costa et al., 2013, p. 1018)

Vocabulary and Inferencing

Vocabulary plays a large role in a student's ability to comprehend what he or she reads. Solis et al., (2017) examined the correlation between students' understanding of academic vocabulary and their ability to glean knowledge from grade-level textbooks. The sample group for the study was fourth grade-school students, from two rural

elementary schools, with low-reading comprehension abilities as determined by a standardized assessment. Two trained tutors provided the study's intervention, focused on vocabulary, in a small-group setting. A pretest-posttest design assessed students' comprehension of new passages in comparison to similar passages with known vocabulary (Solis et al., 2017). The authors concluded that the students who struggled with reading comprehension also struggled with inferring new meaning from vocabulary words with which they were unfamiliar (Solis et al., 2017). Reading comprehension and vocabulary deficits compound one another; "students with reading difficulties may lag behind their average performing grade level peers in vocabulary acquisition by as much as two years by the end of 2nd grade" (Solis et al., 2017, p. 103). These findings are important because asking a struggling reader to use context clues to determine the meaning of a word they do not know may be a difficult task and potentially frustrating to the student.

The ability to make inferences while reading is another critical aspect of reading crucial to understanding what an author is trying to communicate. Hamilton et al., (2016) aimed to determine if there was a link between students' ability to decode words and their ability to make inferences regarding what they were reading. Non-struggling post high school readers were presented with short passages featuring nonsense words they were required to decode. Upon completion of reading the passages, participants answered inferential questions about the passages (Hamilton et al, 2016). The authors found that students who had difficulty decoding words used more of their working memory to read than students who did not have any decoding difficulties. Because struggling students used more working memory to decode, they had a much harder time making inferences

about what they were reading (Hamilton et al., 2016). Teachers, especially at the secondary level, often focus solely on inferencing skills. If the student has not mastered decoding, however, demonstrating inferencing skills is much more difficult. While the many components of reading influence a student's reading ability, there are also external factors that play a role in affecting a student's reading abilities.

External Factors That Affect Reading

When looking at the subject of reading comprehension, or specifically contemplating students who struggle with reading, it is important to consider the multiple factors outside of the classroom that play a large role in how students learn. These factors include potential family history of reading difficulties, behavioral difficulties, and socioeconomic background. All the aforementioned factors affect students' academic success in the area of reading.

Giménez et al. (2017) stated, children of parents who themselves have reading impairments have poorer reading performance and require increased instruction to master reading skills compared to children of parents who have typical reading skill. The study noted that children from families with a history of specific learning disabilities or dyslexia are more likely to be diagnosed with one of the aforementioned reading difficulties. Giménez et al. (2017) asserted that knowing family history is extremely important for reading intervention because families can provide early intervention at home as well as schools if aware of an increased risk. Jerrim, Vignoles, Lingam, and Friend (2015) also described the link between a student's heredity and achievement in terms of reading ability. An additional factor in this regard is that parents who struggle with reading have a much harder time assisting their children in reading.

Costa et al. (2013) also noted a link between early emergent reading difficulties and students with behavior problems. This link has been documented in children as young as preschool aged; the link remains correlative well into later childhood. Costa et al. (2013) pointed out students who present as having ADHD or being inattentive in early elementary school are often evaluated as having reading deficits throughout their schooling years. Learned (2016) also conducted a study to examine the relationship between low reading ability and students' classroom behavior. The study was conducted at a high school where eight boys were selected to participate. Data collected occurred through observation of the students in the classrooms, interviews with the students and teachers, and records of academic performance (Learned, 2016). The study concluded that, "improving literacy and ensuring youths' rightful participation as valued members of school communities require disrupting the tacit conflation of reading difficulty and behavior problems among secondary school contexts" (Learned, 2016, p. 1272).

Another factor that affects students' success in reading and in school in general is their socio-economic background; "50% of children from low-income families read below a basic level, as opposed to 21% of higher income children" (Morris et al., 2012, p. 99). Parents often want to help their children who have literacy struggles at school. Unfortunately, those parents often have literacy problems or are in a financial situation where they do not have the time or ability to provide an appropriate intervention at home (Giménez et al., 2017). This leads to some students from low socioeconomic backgrounds to enter school with limited literacy experiences.

In sum, several factors affect students' reading ability. Students' family history pertaining to reading disabilities, students' behavior in the classroom based on their

reading ability, and students' socioeconomic backgrounds can affect how the students read and perform in school. While these factors take place outside of school, it is the teacher's responsibility to understand and counteract these factors in the classroom.

Research Conducted on the Secondary Level

Bemboon and McMaster (2013) examined reading intervention at the high school level and compared the effects of teacher-directed intervention and peer-mediated intervention on sophomores identified as struggling readers. Screening included all students in the school, excluding those in honors English classes; the data pinpointed the students who would receive the targeted interventions. The peer-mediated intervention consisted of three activities: collaborative reading, retelling, and paragraph shrinking (Bemboon & McMaster, 2013). The first stage of the intervention was collaborative reading where the more fluent reader began reading and the less-fluent reader followed along. This activity was followed by a reversal in roles where the less-fluent reader re-read what they have just heard; a second phase of the intervention featured students re-telling what they had just read (Bemboon & McMaster, 2013). For the third phase of the intervention, "Paragraph Shrinking includes the following steps: (1) Name who or what the paragraph is about, (2) Name the most important thing about the who or what, and (3) Say the main idea in 10 words or less" (Bemboon & McMaster, 2013, p. 189). Teacher-directed intervention involved the same three components, but the teacher worked with a small group of students, as opposed to peer-mediated where the intervention was administered one-on-one. When compared to the students in the control group, the study's findings showed student improvement in both the teacher-directed and peer-mediated groups. While both groups who received reading intervention showed

improvement, there was not a notable difference between the teacher-directed and peer-mediated groups (Bemboon & McMaster, 2013).

Reading is a complex skill that involves many skills that students need to master. Cirino et al. (2013) examined different components of reading (i.e., decoding, fluency, and comprehension) to determine if there is an overlap or pattern in these skills. This study involved students in the sixth, seventh, and eighth grades. The students in this study completed a variety of sub-tests that evaluated the specific components of reading, including the skills of decoding, fluency, and comprehension. Data from the subtests indicated that students who have lower reading comprehension scores also face challenges in their fluency and decoding abilities (Cirino et al., 2013). Cirino et al. (2013) claimed that "adolescent literacy has emerged as a major problem for research and instruction over the past decade, with approximately six million adolescents recognized as reading below grade level" (p. 1060).

Unfortunately, little research has been conducted with students past the elementary level (Jeffes, 2015). Students should improve their reading skills as they continue through school; however, the literature has suggested that is not the case (Cirino et al., 2013). For this reason, there are students who are falling four to six grade levels behind in their reading skills (Cirino et al., 2013). The hypothesis of the study was that students who struggled in reading did so in multiple areas of reading and not just in one area.

Cirino et al. (2013) looked at the areas of decoding, fluency, and comprehension. These individual skills were all tested through a variety of assessments. Evaluation of the data occurred to determine which students struggled in each of the categories of reading

and to identify any patterns that emerged (Cirino et al., 2013). The authors found that students who were struggling readers most often struggled in more than one area of reading. The authors also found that the few students who only struggled in one area usually struggled in reading comprehension (Cirino et al., 2013). When looking at struggling readers, it is important to look at all components of reading, and not to simply focus on one aspect or area. This is also critically important when looking at intervention. This study concluded that interventions that have include multiple components of reading best support students.

The educational standards in our country are becoming increasingly rigorous; "high-achieving secondary school students are expected to thrive in response to the more challenging standards, whereas students with reading difficulties will no doubt experience considerable challenges" (Vaughn et al., 2015, p. 547). Reading intervention is increasingly necessary at the secondary level in order to close achievement gaps for students and allow them to be more academically successful in all their classes. The researchers identified students for this intervention based on scores from the previous year's state reading assessments. Selected students were placed in a reading intervention class that met once a day and, had a focus in the areas of word study, contextual vocabulary, comprehension, and student engagement (Vaughn et al., 2015).

Phase I of the intervention focused on word study and the decoding of words; students were exposed to new vocabulary words each week from the texts that they were reading. Students learned comprehension strategies during Phase I and learned to apply what they were learning to texts they were reading in both their science and social studies classes (Vaughn et al., 2015). During Phase II, the class was structured around

instructional units where students applied the strategies they learned about reading to texts that focused on topics they were covering in their other core classes. The study also addressed student engagement by reading texts that pertained to their other classes, setting student-specific content learning goals, and allowing students time for free choice reading (Vaughn et al., 2015). Data analysis proved that the two-year reading study was effective at improving students' over-all reading abilities. It also found that improved reading abilities subsequently raised grades in their social studies classes (Vaughn et al., 2015).

Another aspect evaluated in this study was students' perceptions regarding how they were reading and subsequently progressing in school; the study suggested that such impressions play a significant role in student success. Students who think they are currently successful are much more likely to be successful, as opposed to students who currently think they are not successful. Frankel (2016) examined students' perceptions about themselves as readers and the goals of the teacher who taught reading intervention classes on campuses; Frankel (2016) noted improvements that needed to be made to a reading intervention class. Mr. Taylor's reading intervention class was observed in this study. Mr. Taylor's class was a supplemental reading class that took the place of a student's elective during the day. Mr. Taylor set the tone for his class by, "reading aloud a letter he had written to his students in which he explicitly called attention to this goal, explaining, 'I teach this class because I love reading and I want to share my enthusiasm with you" (Frankel, 2016, p. 45). Mr. Taylor recognized that many students in his class had a negative attitude towards reading that he aimed at correcting. Regardless of their reading skill, he believed that all students could benefit from the structured reading in his

class. Observation of several behavioral issues were in the reading class were noted (Frankel, 2016). One student in the classroom, Dennis, self-characterized himself as a good reader and would often correct other students in the classroom, laugh at other students' mistakes, and refused to work independently on his reading assignments (Frankel, 2016). Eventually there was a confrontation between the teacher and Dennis when Dennis was asked why he was not completing his reading assignments. Dennis noted being checked up on and asserted that it made him feel dumb.

> By checking in with Dennis to verify his reading progress, which Mr. Taylor did regularly with all the students in the class, he overtly positioned Dennis as a struggling reader. Dennis's improvisation was a way to resist the subject position imposed on him. (Frankel, 2016, p. 47)

Frankel (2016) noted an adjustment that would improve the overall success of this reading intervention class. Teachers need to be cognizant of the impact that placement in an intervention class has on students' self-perceptions as readers. This is not to say that schools should eliminate intervention classes; the implication of such placement, however, is simply something that teachers need to be aware of and combat in their classes.

Reading ability is critical to academic success; "at a time when students' advanced educational attainment is increasingly essential for social and economic development, Western countries are grappling with high rates of students who drop out of school before completing the secondary grades" (Cantrell, Almasi, Carter, & Rintamaa, 2013, p. 26). Elementary-aged students are out-performing high school students on standardized reading assessments. Cantrell et al. (2013) surmised that this is due to high

school teachers not feeling prepared or responsible for teaching reading skills in their classrooms. This study examined the success of teachers and students using the *Learning Strategies Curriculum* with students in 6th and 9th grade. Prior to implementation of the intervention, teachers received professional development regarding the six components of the intervention: word identification, visual imagery, self-questioning, specifically designed vocabulary strategies, sentence writing, and paraphrasing (Cantrell et al., 2013). The design of the intervention provided continued professional development for the teachers during the school year while they were working with the students.

Word-identification activities focused on decoding multi-syllable words to aid in comprehension. The visual imagery unit had students work on creating visual images of what they were reading. The self-questioning intervention required students to ask questions and make predictions about what they were reading. Finally, paragraphing activities comprised students reading passages and identifying the main idea (Cantrell et al., 2013). "The vocabulary strategy is designed to help students identify and define words in text. The Sentence Writing Strategy is designed to help students learn to write various types of sentences" (Cantrell et al., 2013, p. 35). Cantrell et al. (2013) concluded that the sixth-grade teachers had a higher level of efficacy than the ninth-grade teachers did, but the ninth-grade teachers adhered to the provided curriculum at a higher rate than the sixth-grade teachers did. Student progress in reading was correlated to teacher fidelity when implementing the intervention (Cantrell et al., 2013).

Another study examined students in secondary schools with learning disabilities to see if a specific reading intervention that focused on phonics-based learning was successful. Jeffes (2015) recognized that most reading interventions and studies include a

sample that is exclusively primary-school children; there was a gap in research concerning secondary-aged students. The study also found that students in special education with diagnosed reading disabilities benefited from intensive reading intervention. Jeffes (2015) further found that "this form of intervention can be effective even if it occurs significantly after initial reading training has occurred" (p. 82). This study supported the notion that reading intervention can be successful for students in special education.

Response to intervention (RTI), is another widely used intervention method to correct deficits in reading ability. Solis et al. (2014) utilized a tiered RTI method to determine students who needed targeted reading intervention. The authors determined, that students who have low reading levels could make the most progress if they worked with texts that also built background knowledge for other subjects they were studying in school (Solis et al., 2014).

Student tutoring intervention has also shown success in improving struggling students' reading abilities. Lingo (2014) studied high school students who were tutoring middle-school, special education students in oral reading. The students used a program that worked on three specific aspects of oral reading: phonics, sight words, and story passages. The students were involved in their own learning, received immediate feedback on how they were doing, and tracked their own progress (Lingo, 2014). The students in this study not only showed progress with this method, but also reported that they enjoyed the program and appreciated how it was structured (Lingo, 2014).

Vocabulary is an important aspect of reading: if a student can decode a word but does not know what that word means, they may not comprehend the true meaning of

what they are reading. A large number of students come from low socioeconomic backgrounds where their parents spend a lot of time working and are not always home to help develop these skills. Biemiller (2010) conducted a study that included English language learners whose parents did not speak English; consequently, the subjects of the study were unable to develop a large English vocabulary outside of school. Biemiller (2010) stressed the importance of students knowing root words and used such words as the basis for building additional vocabulary knowledge.

The creation of the present action research study took all of these components into account. Students read relevant, varied texts not only to increase their interest, but also to help provide background information to which they may not have previously been exposed. The teacher-researcher provided students feedback on their progress, so they could see improvement and stay motivated to continue working.

Reading Intervention Research

The literature separates various reading interventions into several categories based primarily on the target audience of the intervention. The studies are categorized as targeting: (a) students in general education, (b) students who are in the tiered RTI system, and (c) students who are currently being served in special education. Finally, many scholars discussed curriculum theories concerning reading instruction and intervention.

When analyzing the research that has been conducted on specific reading interventions, it is important to consider not only the component on which the intervention has focused, but also the population of students that was used in the study. The following studies were conducted with students who were in middle school or high school. Some of the students were in general education, while others were in special

education or classified as ESL. It is critical to consider how the information in these studies can be applied to the present study in order to incorporate aspects of past interventions that have been successful and exclude aspects that were not.

Phonics-Based Reading Intervention

Jeffes (2015) noted that most phonics-based intervention studies have been completed on students in the elementary range, highlighting a large gap in the research for students in middle or high school. The study demonstrated that by providing high school students with a specific and structured phonics-based intervention curriculum, students in high school could improve their phonemic awareness (Jeffes, 2015). These findings suggest that a structured reading intervention can be successful for students who are high-school-aged, suggesting that students in the present study are not too old for reading interventions.

Multi-Component Reading Intervention Studies

Vaughn et al. (2010) conducted a study that focused on decoding, spelling, fluency, comprehension, and vocabulary. The students in the study were middle-school students struggling in reading according to state assessment scores; selected students were currently in RTI, but not in special education. The students participated in a three-phase intervention; each phase focused on different components of reading and built on concepts learned in the previous phase(s) (Vaughn et al., 2010). The authors found that students in the intervention made improvements in decoding, spelling, and comprehension, but were not able to "close the gap" between their reading ability and their peers during the span of the study. These findings emphasized that, while intervention can be successful with struggling readers, it takes more than just a few

months to bring struggling students' skills up to grade-level competency. Edmonds, Vaughn, Wexler, Reutebuch, Cable, and Tackett (2009) noted similar results in a review of 29 previous studies focused on the ways in which reading interventions have improved the abilities of students in Grades 6–12. Overall, the data suggests that students who struggle in reading can improve when given targeted intervention (Edmonds et al., 2009).

Reading Intervention Studies for Students in Special Education

Several reading intervention studies focus on students in special-education with diagnosed disabilities. These studies were critical to take into account when conducting the present research study, mainly so that aspects that were successful in previous studies could be taken into account and so that practices that were not successful could be improved upon. Students in special education with reading disabilities, including students who come from low socioeconomic homes, can improve their reading ability when provided with reading interventions (Vaughn et al., 2011).

All aspects of a study are important to consider, including the structure of intervention, group size, individualization, and retention. Solis et al. (2014) found that interventions with groups of eight to 10 students were just as effective as interventions using smaller groups of only four to five students. This was determined through a longitudinal study that took place over the course of three years. The sample group included students in grades six through eight with predetermined reading difficulties according to a standardized test taken during their fifth-grade year (Solid, 2014). The same tiered reading intervention was administered to different sized intervention groups; researchers compared relative gains in both populations. Both size groups received reading intervention and no notable difference existed between the smaller and larger

sample size (Solis, 2014). The authors also found that individualized interventions—as opposed to structured and ridged interventions—lead to more growth in students with diagnosed learning disabilities.

The study also looked at intervention length in relation to retention. If the intervention was discontinued, the students who needed the most structured and intensive intervention, tier three level students, did not retain the skills they had learned (Solis et al., 2014). This study suggested that, for students in special education, intervention should be sustained; the cluster of skills related to reading need to be reinforced and developed gradually and continually because, as demonstrated earlier, all components of reading are interdependent and necessary for permanent improvement in reading level.

Students diagnosed with specific learning disabilities often have academic deficits in many areas of reading including decoding, word recognition, and fluency. Additionally, such students often have limited prior knowledge to help them relate to or contextualize the text that they are attempting to read (Botsas, 2017). Botsas (2017) discovered that students with specific learning disabilities had a significantly harder time comprehending expository texts versus narrative texts. This may have been due to the higher-level vocabulary in expository texts, unfamiliar text formats, or a lack of prior background knowledge pertaining to the subject (Botsas, 2017). Botsas (2017) conducted a study with students diagnosed with specific learning disabilities. The students were presented with expository and fictional texts as well as comprehension questions about the text. Students had a much harder time with the expository texts (Botsas, 2017).

The intervention used in this study was to have students do “think alouds” while reading both narrative and expository texts to help encourage students with learning

disabilities to be more interactive with the text that they were reading. The study determined that, when compared to their peers without diagnosed disabilities, students with specific learning disabilities were thinking on a more surface level about the text (Botsas, 2017). It was also determined that when reading the expository text, students with specific learning disabilities had a hard time comprehending and were largely unable to conduct a "think aloud" because their comprehension of what they were reading was limited. This study demonstrated that students with reading deficits have an easier time comprehending narratives than expository texts. In creating the present action research study, the teacher-researcher applied these findings to the creation of a curriculum that would ensure that students were exposed to a variety of texts in order to increase familiarity and comprehension ability.

Many students in special education can have severe reading disabilities, as well as the challenge of being classified as an English language learner (ELL). A study was conducted with students who fell into these categories to determine if a modified phonics-based intervention with an ELL component could improve these students' reading abilities (Denton, Wexler, Vaughn, & Bryan, 2008). Students who qualified for the study met the following three criteria: currently served through special education, classified ELL students, read 80 words per minute or fewer. The study lasted 13 weeks and focused solely on decoding. At the end of the study, the data showed that the form of intervention utilized was not effective for students with this particular set of circumstances, though students showed no signs of regression during the study's duration (Denton et al., 2008). It is important to know the severity of the students' reading deficits

to plan a successful intervention that can be administered frequently and over an extended period in order to improve student progress.

While the above intervention was not successful in improving students' decoding skills, other studies have shown progress in improving word recognition for non-ELL students in special education. Bhat, Griffin, and Sindelar (2003) analyzed a structured phonological intervention where concepts started at a basic level and progressed to lessons that were more difficult. The lessons were presented orally; students responded verbally and tracked their progress on a chart. The authors found that students scored higher on their posttest than they had on the pretest taken before they were given the intervention. Students were also tested again a month later, and it was determined they retained the skills they had been taught (Bhat et al., 2003). When planning and providing an intervention, it is important to take into account different learning styles. This intervention focused on auditory learners; it likely held the most benefit for students who are auditory learners. The teacher-researcher designed the present study to include ways for students to learn both auditory and visually.

Many special education students struggle with academic and nonacademic vocabulary. Limits to a student's vocabulary greatly impede a student's ability to comprehend what they are reading. Solis et al. (2017) noted a correlation between difficulties in vocabulary acquisition and struggles in reading comprehension for students with specific learning disabilities. The study implemented an intervention in which students worked in small groups with a tutor a few times a week to help improve vocabulary and textual understanding (Solis et al., 2017). The intervention included four aspects: self-monitoring, vocabulary instruction, text-based reading, and conclusion/self-

assessment. Prior to reading a text, students were asked to set goals regarding what information they hoped to glean from the text while recording and reporting their attitudes regarding the text. Next, students were introduced to specific vocabulary that they would be seeing in the text; the intervention provided three new words each session in addition to reviewing two, previously introduced words (Solis et al., 2017). Finally, students read and discussed the text; they were asked questions and had to re-read the text to determine the answers. Each intervention session concluded with students re-evaluating their goals to see if they had been met (Solis et al., 2017). The study demonstrated that goal setting allowed students to visualize and imagine making progress and then to notice the progress they were making, particularly as their attitudes toward reading began to change. The reduced group size utilized by the reading intervention also proved to be successful for the students. This teacher-researcher considered both of these findings when designing the intervention centered by the present study.

Theoretical Framework

Several aspects of best teaching practices and strategies have been applied to providing appropriate and successful reading intervention for students who have deficits in that area. The theory of progressivism focuses on teaching children through real and holistic experiences with a student-centered philosophy (Bruce, 2013). These ideologies were applied to reading instruction and intervention in ways that benefitted all students' understanding and abilities (Bruce, 2013).

Dewey, an educational reformer and founder of progressivism, felt that because the world was always changing, education had to change with the world and could never function as a formula to be used repeatedly with every student (Bruce, 2013). Dewey

believed that there were many problems with most models of traditional education in which students exclusively sat in desks listening to lectures (Dewey, 1997). He believed in progressivism, a political and philosophical approach to education that requires taking traditional knowledge and making it matter to students in order to encourage students to be increasingly engaged and involved in their own learning (Dewey, 1997). Dewey (1997) emphasized personal experience and made a connection between students' lived experiences and their education. Dewey (1997) offered several important and enduring innovations to the classroom, namely calling for education focused on growth and interaction, a re-imagining of the role of teachers as facilitators, and a general emphasis on providing students with content and information in preparation for their specific futures. Tying these elements together in a reading class means choosing texts based on the students and not simply the needs of a course. Dewey's legacy of theory suggested that texts relatable and relevant to a specific cohort of students would allow the students to become better readers more prepared to succeed in their specific path through high school their adult lives. When schools structure their curricula and interventions around a progressive ideology, students score significantly higher in intellectual competence, cultural development and practical competence while developing their own life philosophy, character traits, emotional balance, social and physical fitness, and sensitivity to social problems (Bruce, 2013).

Reading Motivation Theory

Reader motivation theory (RMT) examined reading through the lenses of three questions of self-reflection that students were to ask themselves in the process of learning how to read. The first of these questions forward by RMT was "Can I be a good reader?"

Wigfield (2017) extrapolated: “the primary constructs captured by this question include children’s ability beliefs, expectancies for success, and self-efficacy” (p. 60). The student must first believe that they can be successful and become a good reader before they are even motivated to begin the process of learning to read. The second RMT question for students to ask themselves was, “Do I want to be a good reader?” This question was intended to address extrinsic and intrinsic motivational factors for each individual student. A student with strong extrinsic or intrinsic motivational factors to read will be more motivated to work hard at becoming a successful reader than a student who is not motivated (Wigfield, 1997). Once students worked through both of the aforementioned questions, determining that they can and want to be a good reader, RMT asked them to ask themselves “How can I become a good reader?” RMT posited that, though this question is easily answered for younger children in early grades where teaching the basic components of reading is primarily done as whole class instruction, it was worth asking older learners. Figuring out how to improve becomes much harder for students at the high school level because at an age they are expected to already be strong readers; prior to the implementation of the new reading class, no intervention had been provided to support them as students in secondary grades in the process of becoming stronger readers. As such, the final RMT question required students to formulate a reading improvement plan, drawing on previously taught strategies, self-regulation, and help from others (Wigfield, 1997).

Students in the present study worked through the first two questions described in RMT prior to the intervention of the 18-week reading course. They all decided that they could be a good reader and that they want to be a good reader; this teacher-researcher

designed the intervention as a means of asking the third RMT question regarding how they can become good readers. These students all agreed to be placed in the reading class with the knowledge that the class was designed to target specific basic reading skills and evolve into increasingly complex skills and concepts as the students mastered initial concepts and skills.

Summary

Research has demonstrated that reading interventions can be effective for students at the secondary level who are in special education. The present study aimed to replicate the successful aspects of other studies in this action research study. While Jeffes (2015) pointed out the gap in research on struggling students at the high school level, several studies contributed vital ideas and models to the design of the present action research study. Vaughn et al. (2010) demonstrated that intervention could focus on multiple aspects of reading and still be effective in improving read skills for students who are already classified as struggling readers. Denton et al. (2008) concluded that working with students in special education solely on decoding skills was not an effective intervention in respect to improving overall reading abilities. Solis et al. (2014) found that intervention groups can be as large as ten and still be as effective as smaller groups, but also discovered that when working with students in special education, students need to continue working on reading skills after the intervention is over in order to continue to make progress.

The intervention at the heart of the present study was designed according to best practices outlined in the literature. The intervention group sizes were kept as close to ten students as possible. The intervention itself did not focus exclusively on one aspect of

reading but centered the tasks and skills of decoding, fluency, and comprehension, an approach that has been indicated to be more successful than single-focus interventions (Jeffes, 2015).

Following the literature, the researcher conducted a pretest, provided the intervention, and then administered a posttest as a means of determining the relative success of the intervention. The teacher-researcher plans to administer the posttest again after a specified period has passed to determine if the students have retained gains made during the intervention period. A few of the studies reviewed in this chapter had a qualitative component where the students responded to how they felt about the intervention. The teacher-researcher designed the present study to replicate this activity in order to observe any changes the intervention fostered in participating students' self-identity as readers and to see if students viewed the intervention as engaging.

Many of the studies reviewed in this chapter faced some limitations that the present study also encountered. Many researchers, including this teacher-researcher, reported having little control over when and how often, students attended class and participated in the intervention. This teacher-researcher designed the intervention in the hopes that the students would attend regularly during the time of the intervention and that class size and grouping would prove appropriate for the designed intervention. Several of the preexisting factors affecting reading, including socioeconomic background, ELL status, and parental reading abilities, may have affected students during the reading intervention.

CHAPTER 3 – METHODOLOGY

Introduction

Extensive research within the field of reading intervention has focused on elementary-aged students. However, few studies have examined high school reading interventions, particularly interventions administered to high school students in special education. The aim of this action research study was to implement an individualized, structured reading intervention program, System 44™, with high school students in special education with the goal of improving reading abilities as well as students' attitudes towards reading. The intervention provided focused, individualized instruction to students in special education who were reading far below grade level. The program aimed to improve their proficiency in the areas of decoding and reading comprehension. The teacher-researcher used a concurrent mixed-method design to collect both quantitative and qualitative data using a pretest-posttest format.

Problem of Practice

The problem of practice addressed in this study was that students in special education at the high school level were reading approximately eight grades below grade level. Prior to the implementation of System 44™, no reading intervention programs existed for this subset of student. Additionally, this student group was enrolled in English classes focused on grade-level texts that the students could not read or understand independently. A specially designed curriculum that addressed reading skills starting at

the students' instructional levels was needed to fill in the knowledge gaps these students had in the areas of decoding and reading comprehension.

Research Questions

The present research study addressed the following research question and two sub questions: What effects will a structured, individualized reading intervention course have on the Lexile levels of high school students receiving special education services? What effects will a structured, individualized reading intervention course have on the grades of high school students receiving special education services? How does the students' progress in their reading intervention course relate to their feelings about reading and their overall self-perception as it pertains to reading?

Research Design

Traditional educational research involves an outside researcher conducting research in a classroom for which they are not the teacher. This form of educational research aims to determine and understand "educational issues, questions, and processes" (Mertler, 2014, p. 7). The researcher uses multiple processes to conduct this research including both deductive and inductive reasoning methods. With increased pressure to improve education in this country, traditional education research has shifted to include a focus on action research (Mertler, 2014).

In contrast, action research focuses on reflective teaching, allowing the teacher to use a variety of forms of data to determine the effectiveness of current teaching methods as well as to ascertain potential improvements (Mertler, 2014). Although there are several models for action research, all action research focuses on improving teaching practice, overall school improvement, and increased teacher empowerment via involvement in

their classrooms (Mertler, 2014). The basic steps of action research begin with identifying a problem or area of potential improvement in the current teaching methods. Next, the teacher-researcher determines a potential solution and proceeds to test the solution to determine if the new method is beneficial for the students' learning process. If successful, the new method is applied to other lessons and subjects (Mertler, 2014). If the new method is ineffective, the teacher-research works to create new innovative methods for implementation while repeating the evaluation process (Karagiorgi, Afantiti-Lamprianou, Alexandrou-Leonidou, Karamanou, & Symeou, 2018). While all reflective teaching requires teachers to analyze data to determine which concepts the students master, action research, "reflects an instrumental problem solving approach, made rigorous by the application of scientific theory and technique" (Karagiorgi et al., 2018, p. 240). Action research in the classroom promotes teacher ownership in improving teaching techniques by focusing on changes that arise specifically out of monitoring student progress.

Rationale for Mixed-Methods Design

When conducting mixed-methods research, the researcher analyzes both qualitative and quantitative data. Using multiple sources of data is beneficial because varying forms of data supplement each other as well as increase validity and dependability (Zohrabi, 2013). A mixed-method design is especially beneficial when conducting action research in the classroom. Many educators feel that using both types of data provide a wider breadth of information from which to analyze and determine the success level of the provided intervention (Mertler, 2014). Additionally, a mixed-method

design does not limit the types of classroom data collected and analyzed (Doyle, Brady, & Byrne, 2009).

This teacher-researcher selected a concurrent mixed-method design for this study because it facilitated the simultaneous evaluation of both qualitative and quantitative data to determine the holistic success of the intervention. The teacher-researcher compiled a variety of quantitative data including Lexile levels (Research Question 1) and overall grades point averages (GPA) and grades in English class (Subquestion 1) to determine the success of the intervention. Additionally, qualitative data were collected through open-ended questionnaires that recorded students' attitudes about reading and self-perception of their reading abilities (Subquestion 2). Figure 3.1 presents a summary of the research design. Both forms of data held an equal level of importance (Mertler, 2014).

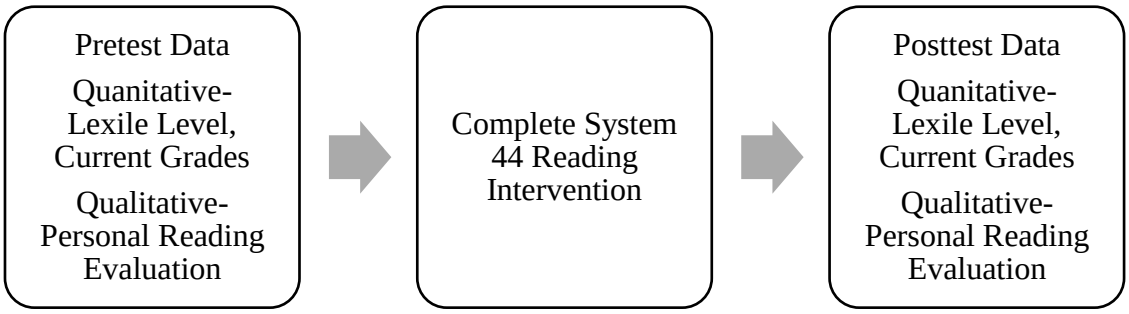

Figure 3.1. Summary of the research design.

Context and Setting of the Study

This action research took place at Hutson High School (HHS).[2] Hutson High School is one of four high schools in the school district and includes freshmen through seniors. The school district is located in northeastern Texas; the high school originally opened in 1890 and is the oldest high school in the district (Richardson High School,

[2] Pseudonym

n.d.). At the time of the study, HHS had 2,684 enrolled students. The demographics of the school were as follows: 39% of the student population was Hispanic, 29% was Caucasian, 20% was African American, and 7% was Asian (Richardson High School, n.d.). The school was 50% male and 50% female, respectively; 47% of the students qualified for and received free or reduced lunch; 5% of students were English Language Learners, and 13% of the students in the school were being served and supported through special education. There were 246 faculty and staff members working at Hutson High School at the time of the research study (Richardson High School, n.d.).

The school day was comprised of seven 50-minute class periods. The students in the research study followed the same daily schedule as all other general education students, and participated in the intervention once a day in a new reading intervention class, "Fundamentals of Reading," which was taught in the special education setting for students currently in special education needing reading intervention instruction.

Hutson High School's educational practices reflect both progressive and essentialist curricular ideologies. In Texas, high-stakes testing is an integral part of the education system; the HHS curriculum reflects that, especially in subjects that are state tested (i.e., English I, Algebra I, Biology, English II, and U.S. History). These subjects fit into essentialist theory curriculum based on the skills required to pass the state assessment. The teachers use the prior year's tests to ascertain how skills are addressed to further prepare students for the test. "The rationale is that if teachers are teaching from standards-based instructional materials, students' chances of performing well on tests also increases" (Causey-Bush, 2005, p. 334). The aim is to provide students with the knowledge required to master concepts; evaluation of mastery is determined by

standardized testing (Miles, 2016). This aligns with essentialist theory, where the subjects of importance are English, science, history, and math (Miles, 2016.), those subjects for which standardized testing determines whether a student has mastered the material. In these classes, the teacher is often the center of the classroom and acts as the authority in both curriculum and classroom management. The components of *No Child Left Behind* continue to govern this curriculum and pedagogy; classes feature high-level standards, standardized testing, and data broken down by specific subpopulations; and the schools' progress is monitored each year based on the test scores (Miles, 2016).

Non-state-tested subjects taught at the school follow a more progressivist approach and are becoming increasingly learner-centered as opposed to standard-centered. According to Dewey (1997), "all genuine education comes about through experience" (p. 14). Classes are implementing project-based learning, where the student responds to questions or completes a task; from there, the student applies the concept to a hands-on, real-world application. Project-based learning aims to "promote deep . . . learning among all students through active engagement in using and applying knowledge in the context of disciplinary practices" (Harris et al., 2015, p. 1365). This concept of learning though activities aligns with the lab school Dewey created. The teacher exists to help the student solve a problem and develop inquiry; however, the teacher is not the center of the education process (Miles, 2016.). Hutson High School has not fully adapted a progressive approach because most courses are offered in tested subjects and taught in traditional classrooms environments. However, it is understood that students benefit from interdisciplinary instruction (Baker & Daumer, 2015). This type of curriculum helps

students to learn in a more individualized manner, equipping them with problem-solving skills and the desire to become lifelong learners (Wilhelm, 2014).

Role of the Researcher

This teacher-researcher was an active participant in the intervention. The teacher-researcher taught the class in which she implemented an individualized reading intervention, System 44™, and then determined the effects of intervention on students' reading. The role of the researcher in action research is "participative, since educators are integral members—not distant outsiders—of the research process" (Mertler, 2014, p. 20). The researcher was the classroom teacher, responsible for day-to-day planning and teaching as well as collecting data to analyze in order to determine the effectiveness of the intervention.

The teacher-researcher has taught at the high school level for the past 7 years. Each of those years, she worked with different aspects of students in special education teaching English. The classes included course offerings in the special education setting as the teacher of record and co-teaching general-education classes to support special education students in their educational placement. The researcher has taught freshman through seniors with varying disabilities requiring a varied level of support.

Student Participants and Demographics

The sample used in this study was a convenience sample because it included all students currently enrolled in the class. Students were selected based on their reading inventory scores. Exclusionary factors for placement in the class and thus the study included students who had a Lexile level greater than 500 and students who did not possess the cognitive function necessary to improve their current reading abilities. To

ensure that the students' schedules were adjusted, the final step in placement required conducting Annual Review and Dismissal meetings to amend the students' IEP to place the designated students in the reading intervention class. The data collected denoted documented Lexile levels far below their current grade level. No attrition occurred during this study because all seven students who started the intervention competed it as well.

Sample Characteristics

The Fundamentals of Reading class commenced with six students with a seventh student added during the second week of instruction. Three students had specific learning disabilities. The first had been evaluated as having disabilities in the areas of oral expression, written expression, reading fluency, reading comprehension, math problem solving, and basic reading. The second student qualified in the areas of written comprehension, reading comprehension, math problem solving, and math calculation. The third student qualified in the areas of reading comprehension and math problem solving. The student with the other health impairment qualified as a student with attention deficit hyperactive disorder. Of the seven students, there was one ninth grader, three tenth graders, and three 11th graders. One of the seven students was female and the remaining six were male. Beginning Lexile levels prior to the implementation of the intervention ranged from beginning reader to 465 as seen in Table 3.1 below. In comparison, the range of Lexile levels expected of students in Grades 9–11 is 1100 to 1225.

Table 3.1

Assigned Groups and Characteristics of Student Participants

Student	Group	Grade	Gender	Disability
1	A	11	Male	Speech impairment
2	B	10	Male	Auditory impairment

3	B	9	Male	Specific learning disability (oral expression, written expression, reading fluency, reading comprehension, math problem solving, basic reading)
4	A	11	Female	Specific learning disability (written expression, reading comprehension, math problem solving, math calculation)
5	A	10	Male	Speech impairment; specific learning disability (oral expression, listening comprehension, written expression, reading comprehension, math problem solving, basic reading)
6	B	10	Male	Other health impairment (attention-deficit/hyperactivity disorder)
7	A	11	Male	Speech impairment; specific learning disability (reading comprehension, math problem solving)

Data Collection Instruments

This research study included both qualitative and quantitate data collection in a pre-test/post-test fashion to answer the research question and two sub questions.

Quantitative Data

Quantitative data included each students' Lexile level prior to the intervention, overall GPA and numerical grade average (NGA), as well as the students' numerical grades in their English classes.

Student Reading Inventory Testing

To answer the first research question, data were obtained from the Student Reading Inventory (SRI), testing through the System 44™ online program. Data were gathered utilizing a pretest-posttest design. This design requires the teacher to administer a pretest and then implement the treatment condition before administering the posttest (Mertler, 2014). The SRI is self-paced and individualized to obtain accurate

measurements. The assessment begins with a reading passage and a basic reading comprehension question. As students progress through the evaluation, the passage and questions become either more or less challenging, depending on how successfully or unsuccessfully students have answered previous questions, respectively. There was not a predetermined number of questions that student must answer; students answer questions until the program determines their Lexile level. Upon completion of the SRI, a teacher receives a phonemic score, decoding status, and current Lexile level for each student. Data from the SRI were analyzed at the end of the study to determine the success of the intervention. Data were also used to group students for small group instruction and to place the students in the individualized instruction, which took place on the computer.

Being the first year of the reading intervention implementation at the research site, the aim of the study was to determine if the intervention provided any improvement in the area of reading comprehension. Improvement was determined through comparing data from SRI both pre and post-intervention. This study aimed to determine if the intervention provided any increase in the students' Lexile Levels. With no prior data pertaining to these particular students in the area of reading intervention, no predetermined increase goal was set.

Classroom Grades

The teacher-researcher documented students' classroom grades prior to and after the intervention. The students' GPA and NGA were pulled from the schools' online data system. English class grades were specifically noted because English requires a significant amount of reading in comparison with other subjects. Potential changes in

students' grades prior to and upon completion of the reading intervention program were examined to answer the first research sub question.

Reading intervention at the secondary level provided to students in general education not only improved students reading ability, but also improved students' academic performance in other subject areas (Vaughn et al., 2015). This study aimed to determine if reading intervention for secondary students in special education would also improve their classroom performance. This was analyzed by looking at grades solely in their English classes, as well as the students' grades in all classes. Reading ability correlates to student success in all courses because all courses require some level of reading comprehension ability (Korpershoek, Kuyper, & Van Der Werf, 2015). This is especially true for the linkage between reading comprehension and grades in English class because English courses require the most reading of all subjects.

Qualitative Data

The teacher-researcher collected qualitative data in concurrence with the aforementioned quantitative data. Before implementation of the intervention, students filled out questionnaires to rate themselves as readers. The questions included open-ended questions about how students felt when asked to read aloud in class, how they described themselves as a reader, whether they enjoyed reading, their strengths and weaknesses as a reader, and what they would like to improve about their reading abilities. The students filled out the same self-reflection survey at the end of the intervention to see if their feelings about reading had changed.

Personal Reading Evaluation

The teacher-researcher created an open-ended questionnaire to acquire qualitative data. Questionnaires can be open-ended, closed, or a combination of the two. Questionnaires are multi-beneficial in that they provide, gather acquisition on a large number of subjects, and anonymity, which facilitates honesty (Zohrabi, 2013). However, some questions may cause confusion and thus result in inaccurate or unclear responses. Answers were coded by noting if the student had a positive, negative, or neutral answer to the questions. The teacher-researcher compared the pretest and posttest data to determine if the responses stayed the same (either positive or negative) or if more students answered in a positive or negative manner. The two questions from the student reading evaluation used in this study were: (a) How would you describe yourself as a reader? and (b) Do you enjoy reading? Why or why not?

Data Collection Measures

Pretest and posttest data were collected to answer the research question and two additional sub questions. The breakdown of data collection measured used to answer each research questions and sub questions are see in Figure 3.2.

Research Question 1- Impact of Intervention on Lexile Levels	Subquestion 1- Impact of Intervetion on Grades	Subquestion 2- Impact of Intervention on Reading Perceptions
• Pretest/Posttest • Lexile Levels	• Pretest/Posttest • Student GPA, NGA, Grades in English Class	• Pretest/Posttest • Student answers to questions on personal reading evaluations

Figure 3.2. Summary of data collection measures.

Intervention

The specific curriculum for the intervention used in the study was System 44™ Intensive Intervention for Struggling Readers. System 44™ provides a structured 3-week introduction period to acquaint students with procedures and to complete online assessments to determine proper placement and grouping. As previously discussed, students took online assessments prior to beginning the online component. Upon completion of assessments, formation of small groups occurred based on the results from the SRI and SPI. Within the class of seven, there were two small groups; the first group included lowest scoring readers; the second group comprised the highest scoring readers. The students then received teacher-led, small-group instruction. Here, the teacher taught predesigned System 44™ lessons that focused on a variety of topics including decoding, fluency, comprehension, vocabulary acquisition, and writing. Small-group instruction also included several decoding skills ranging from basic to complex. Each group started at a different skill level based on the data from the SPI. Small-group instruction also included working through predesigned units that included reading comprehension passages and questions, discussions, and writing assignments.

Individual online intervention was the second component of the System 44™ intervention. Each student had an individual profile that focused on appropriate skills based on assessment results and progressed through the program as each student mastered a new skill. The online instruction began as basic as letter sounds and then progressed through decoding words and orally reading passages. Students wore headsets and spoke the words for the system to determine if they were decoding correctly. The teacher-researcher viewed reports weekly to ensure students completed their online work;

additionally, reports allowed the teacher-researcher to see student progress and determine what skills to focus on during small-group instruction.

The final component of System 44™ was the students' independent reading. System 44™ provided 36 short books at varying Lexile levels featuring secondary age-appropriate topics. Students chose and read books in their Lexile range and of particular interest to them. While each student read his or her book, a graphic organizer specific to the book was completed. This helped to ensure that the students focused on what they were reading. After completion of the graphic organizer, students took an online assessment reviewing the book they just read.

Classroom Setup and Design

The first 5–7 minutes of each class period comprised full-group instruction. Each day began with a warm-up focusing on word formation. Such activities included creating words with certain vowel or consonant sounds or listing rhyming words. After the students completed their warm-up, each student shared one of their answers. Once the warm-up was completed, the students separated into their two groups and each group went to their preassigned station. One group began with small-group teacher instruction, while the other group began individualized online instruction. Upon completion of the small-group instruction (approximately 20 minutes), the two groups switched activities. This schedule was repeated weekly every Monday–Thursday. Every Friday, all students completed individual reading. Students independently tracked which books they had read as well as their scores on their assessments to monitor their progress.

Research Procedure &Timeline

Weeks 1–3

Weeks 1–3 of the intervention followed the predesigned getting-started curriculum. The goal of the first three weeks was to build a positive classroom community and familiarize the students with what they would be doing. Week 1 focused on creating accounts for the students in the demo site. Instructed on the different components of the online site occurred, and then students independently navigated the online program. In conjunction with the remaining materials for the course, the teacher-researcher presented students with a library orientation. The second week included taking the online assessments (i.e., the SRI and the SPI). The third week comprised an introduction to the rotation system and ensuring the students could work independently without additional questions or concerns (see Table 3.2).

Table 3.2

Schedule Weeks 1–3

Week	Content
1	Create student online accounts
	Allow students to navigate through the online program independently
	Allow students to become comfortable with the technology so they can work independently
	Introduce all System 44™ materials
2	Allow students to take online assessments
	Build classroom rules and procedures
	Create a community in the classroom
3	Introduce rotation system
	Make sure students can work independently on stations
	Finalize classroom procedures and guidelines

Weeks 4–18

A typical weekly schedule began upon completion of the first 3 weeks of introductory curriculum. The weekly schedule was broken down as follows: the first 5 minutes of each class period included a daily warm-up that emphasized word construction, rhyming words, and prefixes and suffixes. When the students walked into the class, they retrieved their journals and noted the warm-up instructions on the board. The students had 3 minutes to complete the warm up, which consisted of listing as many words as possible that fit the warm-up's parameters. After the 3 minutes, the students took turns reading the words they came up with until all words were read aloud and discussed as a class.

After the completion of the warm up, the class broke into small groups, one group began with small-group instruction with the teacher on reading comprehension passages in conjunction with writing assignments. Units were themed and consisted of informational texts, visuals, and writing assignments. Reading passages were categorized by Lexile level and either read independently, completed as oral reading, or read by the teacher-researcher and repeated by the students, depending on the students' ability level and the passage. The small-group instruction also incorporated Strategies for Metacognition, Academic Language, Reading, and Thinking (SMART) lessons and code word/strategy lessons that focused on certain concepts and sounds each week. The SMART lessons built background knowledge and vocabulary support for students who were unfamiliar with the concepts presented. Figure 3.3 illustrates the weekly focus for Weeks 4–18.

The other group worked independently on the computers on phonemic awareness and mastery of skills before progressing to reading comprehension work. The computer-based instruction was completely individualized. Students started at different points in the program based on skills they had already mastered as determined by the SRI and SPI. A student was presented with letter, blend, or word who had to speak the correct sound aloud into a headphone with a microphone attachment. Students did not progress to the next lesson without mastering their current lesson. Upon mastering all phonemes, students transitioned to reading comprehension and spelling. Figure 3.3 provides a breakdown of the focus each week for weeks 4-18.

☑	WEEK	S.M.A.R.T. LESSON	THE CODE/WORD STRATEGIES LESSON
	4	**L2:** Identifying & Understanding Consonants & Vowels	**L11:** Ending *-s*
	5	**L5:** Contrasting Long and Short Vowels	**L27:** Double Consonants *(ff, ll, ss)*
	6	**L7:** Blending Sounds Into Words	**L28:** Final Blends
	7	**L8:** Segmenting Words Into Sounds	**L31:** Closed Syllables
	8	**L12:** Recognizing & Using Possessives	**L32:** Two- and Three-Letter Blends
	9	**L23:** Contrasting Short Vowels	**L39:** Ending *-es*
	10	**L26:** Contrasting Consonants	**L40:** Endings *-ing, -ed /ed/, -ed /d/ /t/*
	11	**L29:** Recognizing and Using Contractions	**L42:** Unstressed Closed Syllables *(a, e, i, o, u)*
	12	**L30:** Understanding Syllables	**L43:** Consonant + *-le, -el, -al*
	13	**L38:** Recognizing and Using Compound Words	**L49:** VC*e* Syllables
	14	**L41:** Identifying Stressed and Unstressed Syllables	**L51:** Inflectional Endings *-ed, -ing* (drop e)
	15	**L50:** Unlocking Multisyllable Words	**L52:** Inflectional Endings *-ed, -ing* (with doubling)
	16	**L58:** Using Open and Closed Syllable Strategies	**L57:** Open Syllables
	17	**L59:** Using Approximation	**L60:** Unstressed Open Syllables
	18	**L62:** Using Patterns to Determine Vowel Sounds	**L65:** Vowel Team Syllables

Figure 3.3. Week-by-week focus.

The System 44™ curriculum also included a library of short, high-interest, age-appropriate books categorized according to the various Lexile levels. On Fridays, students chose a System 44™ book based on their current data and read the book independently. The students also completed a graphic organizer while reading the book and then took an online quiz. If the student passed the quiz, they had completed their work for the week. If the student failed the quiz, they had to retake it while making sure to go back to the book to find the information necessary to answer the questions correctly.

Table 3.3

Weekly Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
Warm-Up-5 Minutes	Warm-Up-5 Minutes	Warm-Up-5 Minutes	Warm-Up-5 Minutes	Warm-Up-5 Minutes
Group 1-Small group instruction 20 minutes	Group 1-Small group instruction 20 minutes	Group 1-Small group instruction 20 minutes	Group 1-Small group instruction 20 minutes	Students get System 44™ book, read, complete graphic organizers, take quiz
Group 2-Small group instruction 20 minutes	Group 2-Small group instruction 20 minutes	Group 2-Small group instruction 20 minutes	Group 2-Small group instruction 20 minutes	
Pack Up 5 Minutes	Pack Up 5 Minutes	Pack Up 5 Minutes	Pack Up 5 Minutes	

Data Analysis

The teacher-researcher used inferential statistics to determine if the intervention was successful in improving students' reading in order to address the first research question and sub question. Comparison of data both in terms of individual student improvement as well as in terms of overall improvement for the class as a whole

occurred. In order to determine the success of the intervention, Lexile score, GPA, NGA, and English grade were analyzed using a Wilcoxon signed-rank test. This test is the nonparametric equivalent of a paired sample t-test. This assessment was appropriate due to the lack of normality of data and limited sample size.

Inductive analysis was used to answer the second research sub-question regarding students' attitudes towards reading and themselves as readers. The teacher-researcher first narrowed down the data from the questionnaires and focused on the two questions that pertained to this research question. The researcher noted if an increased number of students answered the questions in a positive manner after receiving the intervention.

Summary

This study aimed at determining the impact of a reading intervention program, System 44, on high school students in special education using a concurrent, mixed-methods design which allowed the collection of both quantitative and qualitative data to occur in a pre-test/post-test format. The sample population for the study was seven students receiving support from special education with documented Lexile levels far below their grade level at the time. The data collected in order to address the research questions and sub questions included students' Lexile levels, GPA, NGA, English grades, and questionnaire responses. The System 44™ intervention took place over once per day, the course of an 18-week semester. Upon completion of the intervention, the teacher-researcher analyzed and compared the pretest and posttest data to determine if students showed growth in any of the areas evaluated in the research study.

CHAPTER 4 – PRESENTATION AND ANALYSIS OF DATA

Overview of the Study

Problem of Practice

The problem of practice that inspired and prompted this research study was an observed lack of reading intervention for high school students in special education on a specific high school campus. Years of teacher observation demonstrated that students were far below grade level in terms of reading skill and reading comprehension. Formal data collection, through administering a student reading inventory to all students in special education on the campus, confirmed that students were reading far below their current school grade level. The data confirmed the need for a reading intervention to increase these students' decoding and comprehension abilities. Students at the secondary level with disabilities can improve their reading abilities through targeted intervention (Faggella-Luby & Deshler, 2008). Students with higher reading abilities are more likely to make better grades, graduate high school, and be increasingly prepared for postsecondary education and/or employment (Jeffes, 2015).

Prior to this intervention, students in this study had not received coursework or interventions specifically designed to target overall reading skill. These students were required to take 4 years of English courses focused primarily on comprehending and analyzing grade-level texts, which failed to address the existing gaps in students' reading abilities. The creation of the Fundamentals of Reading class addressed the problem of

practice with System 44™ employed as the curriculum to provide reading intervention to improve student reading in the areas of decoding and reading comprehension.

Significance of the Study

This study is significant on an individual student level, local district level, and academic disciplinary level. Prior to this study, participating students had not received any specifically designed reading intervention addressing their areas of weakness and focusing on improving decoding, fluency, and comprehension. Reading intervention and instruction is necessary because "to meet the requirements of colleges and employers in the 21st century students must receive explicit literacy instruction throughout their adolescent years continuing into twelfth grade" (Horbec, 2012, p. 58). Without this intervention, students would not possess the necessary skills required for success post-high school.

In this study, the teacher-researcher aimed to determine the success of a reading intervention at the high school level for students in special education, in order to grow the reading intervention program throughout the district. At the time of the intervention, only two of the four high schools offered the Fundamentals of Reading class for students in special education. Since the time of the intervention, all four high schools have adopted the courses and the number of sections offered at each high school has greatly increased.

This action research study is also significant to the field of academia in advancing research on secondary students in the area of reading intervention. While a substantial amount of research existed in the field of reading intervention for students at the elementary level, far fewer studies centered on students in high school (Jeffes, 2015).

This study had a limited sample size but adds to the research on reading intervention and high school students in special education.

Data Collection Methods

Quantitative and qualitative pretest/posttest data were gathered and analyzed in this action research study. Prior to the intervention, all participating students completed the SRI; the teacher-researcher used the results to determine students' initial Lexile level. The teacher-researcher also gathered student GPA, NGA, and English grades from the school's online data system. Collection of qualitative data occurred via a questionnaire in which students answered opened-ended questions on their feelings on reading in general and self-perception about their reading skills (see Appendix B). All data were stored in a secure location accessible only to the teacher-researcher. Student names were removed from all data and each student was given a number from 1 to 7 for the duration of the study.

Sample Characteristics

The sample was composed of seven high-school-aged students with diagnosed disabilities that required academic support through special education classes. The students were selected for the Fundaments of Reading class and thus the intervention because they had Lexile levels significantly below their current grade level but were deemed cognitively capable of improving and advancing their reading capabilities. The seven students who participated in the study ranged from Grades 9–11. There were six male participants and one female participant. The students had a variety of diagnosed disabilities including speech impairment, auditory impairment, specific learning disability, and other health impairment.

Intervention Strategy

The intervention was conducted over the duration of a semester during a 50-minute class period convened once per day. The intervention followed the System 44™ curriculum and classroom model design. Weeks 1–3 of the intervention focused on introducing the curriculum, the layout of the room, and the centers, while familiarizing students with the online curriculum component. Weeks 4–18 administered the intervention involving individual reading skill instruction as laid out in the System 44™ curriculum. Each class period began with a warm-up completed individually; full-group discussion followed. Next, the class split into the predetermined groups based on student Lexile levels. Group A received small-group instruction from the teacher-researcher while Group B worked independently on the computer-based instruction. Each group worked for 20 minutes before switching stations. On Fridays, students selected a book from the System 44™ library and read the book while completing a corresponding graphic organizer. Students' final Friday activity was to take and pass a quiz covering content from the book they had just read.

General Findings

Pretest and Posttest

The teacher-researcher collected all pretest data, Lexile Scores, grades, and responses to the reading inventory for all seven students participating in the intervention. The only unavailable data was one student's grades prior to the intervention. The students completed SRI testing to determine Lexile levels during the first week of the Fundamentals of Reading Class. The teacher-researcher gathered and compiled GPA, NGA, and English grades for each student prior to the intervention as documented by the

school. Finally, each student completed the personal reading evaluation questionnaire during the first three weeks of the course.

Lexile Levels

Students' Lexile levels provided the baseline data to assess student reading ability prior to the intervention. That data were compared to their Lexile level upon completion of the intervention in order to determine the success of the intervention and answer the study's first research question. Lexile levels were determined through completion of the SRI. Beginning Lexile levels ranged from the coding of "beginning reader," a nonreader, to 465. Table 4.1 provides students' initial Lexile levels, current grade level, and the conversion of their Lexile level to educational reading level. The average Lexile level was calculated and used as an initial data point to compare with the average Lexile level upon completion of the intervention. A score of zero was assigned to the student who scored beginning reading. The average Lexile level prior to the intervention was 266, equating to a 1.7 grade reading level despite the fact that the average grade level in which participating students were enrolled was 10.3.

Table 4.1

Pretest Data– Reading Level

Student	Grade Level	Initial Lexile Level	Educational Reading Level
1	11	Beginning Reader	Nonreader
2	10	308	1.8
3	9	465	2.5
4	11	203	1.5
5	10	274	1.7
6	10	352	2.0
7	11	263	1.7

Grade Point Average and English Grades

The teacher-researcher gathered and compiled each student's NGA prior to the intervention as well as his or her numerical English grades from the school's database. The data used to calculate GPA were taken from the end of the semester prior to students starting the reading intervention program. Grade point average, as well as NGA, was noted to determine potential growth in either measure after the intervention was administered. The students' grades in their current English classes were also denoted. Studies have shown a correlation between student reading abilities and grades, success in high school, and graduation rates: "23 percent of these children [low, below-basic readers] drop out or fail to finish high school on time, compared to 9 percent of children with basic reading skills and 4 percent of proficient readers" (Hernandez, 2011, p. 3). Below average reading corresponds to low grades; data were collected in this study to determine if that held true for students participating in this reading intervention program.

Table 4.2 includes data compiled from the school's online records system. The data were then compared to data collected after the completion of the reading intervention and used to answer Subquestion 1 to see if completion of the reading intervention program had a positive effect on student grades, both generally and specifically in their English class. Data were unavailable for Student 3 because grades from the junior high did not transfer into the high school's online school records system. As seen in Table 4.2, of the six students, four students had passing NGA for the end of the semester prior to receiving the reading intervention, while two did not. The average GPA was 2.11 and the average NGA was a 76. The average English grade was 72, four points lower than the overall class average. When comparing the students' GPAs to their

English grades, three of the six students' English grades were higher than their overall GPA; three students' English grades were lower than their overall NGA. Four of the seven students passed and earned credit for their English class, while the other two students did not.

Table 4.2

Pretest Data– Grades

Student	GPA	NGA	English Class Grade
1	2.14	75.71	78
2	.57	57.43	59
3	Data Not Available	Data Not Available	Data Not Available
4	3.14	86.29	74
5	3.28	88	80
6	1.14	66.85	56
7	2.43	81.86	85

Personal Reading Evaluation

Prior to beginning the intervention, all students participating in the intervention completed the personal reading evaluation questionnaire (see Appendix B). The questionnaire comprised seven open-ended questions. Two questions provided the data to evaluate the second sub question regarding perceptions of reading. This was included in the study because "reading enjoyment is clearly connected to student performance" (Horbec, 2012, p. 58). The teacher-researcher wanted to note students' attitudes towards reading because, "one of the affective variables directly affecting reading is the attitudes of students towards reading" (Baki, 2018, p. 17). The remaining five questions provided insight into the students in preparation for providing the intervention.

Answers in the tables below are verbatim what the students answered on their personal reading evaluation. Due to the students' ages and documented disabilities, writing is very difficult, and students often provide very short written answers to open ended questions. The researcher did not want to coax the students into writing more to avoid students varying from their true answers for the sake of being able to write more information. In future research the researcher will consider allowing students to verbally answer open-ended questions in order to acquire more qualitative data.

In order to evaluate and analyze the data from the questionnaire, the teacher-researcher created a rating system. The teacher-researcher noted if the students answered the question in a positive or negative manner. Replication of the process occurred upon completion of the intervention and the numbers were compared to determine if the intervention resulted in students feeling more positively about reading and themselves as readers. The first question from the questionnaire asked, "How would you describe yourself as a reader?" Table 4.3 provides the participants' answers to the questions. Four students answered negatively when describing themselves as readers, two students answered positively, and one student had a neutral answer. The data were compared to responses to the same question after completion of the intervention to determine if students' attitudes changed.

Table 4.3

Question 1, Pre-intervention

Student	Answer	Positive/Negative/Neutral
1	"Stupid"	Negative
2	"Kinda slow"	Negative
3	"Good reader"	Positive

4	“Need help reading big words”	Neutral
5	“Average”	Positive
6	“Pretty good”	Positive
7	“I suck”	Negative

The second question from the questionnaire was, “Do you enjoy reading?” The question was also open-ended and allowed students to answer however they wanted. The aim was to determine if, upon completing the reading intervention, attitudes towards reading had become more positive because “the reading attitude, which comprises of a complex structure, leads to the improvement with its influence on the development and acquisition of reading skills” (Baki, 2018, p, 17). Table 4.4 houses the students answers to questions 2. Four students answered the second question positively; three students answered negatively. The answers “kinda” and “sometimes” were scored positively because it indicated that each respondent did at times enjoy reading. The data demonstrated that the majority of students in the reading intervention program had a negative attitude about themselves as readers and reading in general. This study aimed to determine if their attitudes improved upon completing the reading intervention and, potentially, increasing their reading abilities.

Table 4.4

Question 2, Pre-intervention

Student	Answer	Positive/Negative Answer
1	“No I don’t”	Negative
2	“Kinda”	Positive
3	“No I do not like reading”	Negative
4	“No it’s boring”	Negative
5	“No I don’t like it”	Negative
6	“I like reading”	Positive

7	"Sometimes"	Positive

Posttest Data

Upon completion of the intervention, students were evaluated again in all categories, including the SRI. The same data points were collected posttest, and students completed the personal reading evaluation questionnaire again.

Lexile Level

To determine students' Lexile levels upon completion of the intervention, students took the SRI through System 44™ again. Although this was the same assessment, there are many versions of the test, so students did not receive the same passages or answer the same questions as the initial evaluation. Table 4.5 presents the results of the posttest SRI. Upon completion of the intervention, the mean Lexile level was 446.86, which converts to an educational grade level of 2.5. Data from the initial student reading inventory prior to the intervention had a mean Lexile level of 266.43, corresponding to an educational grade level of 1.7.

Table 4.5

Posttest Data– Reading Level

Student	Current Grade Level	Posttest Lexile Level	Conversion to Educational Grade Level
1	11	263	1.7
2	10	420	2.3
3	9	660	3.8
4	11	485	2.6
5	10	390	2.2
6	10	540	3.0
7	11	370	2.1

Table 4.6 compares student Lexile levels prior to and after completing the intervention. All students' levels increased post-intervention. The smallest increase was 107 points, while the largest increase was 282 points.

Table 4.6

Posttest Data– Lexile Level Increases

Student	Pretest Lexile Level	Posttest Lexile Level	Amount of Increase
1	BR	263	263
2	308	420	112
3	465	660	195
4	203	485	282
5	274	390	116
6	352	540	188
7	263	370	107

Grade Point Average

Semester grades were compiled from the school's data collection system at the end of the semester during which students received the reading intervention. The data evaluated if increased reading ability of the students translated into improved academic success, both in English classes and across all content areas. The data, broken down by student, appears in Table 4.7. The average GPA after completing the intervention was 2.29, representing an increase from 2.12 prior to the intervention. The average NGA was 77.73, representing an increase from the pretest average of 76.02. Finally, the average English grade was 81.29, a notable increase from the pretest average of 72.00. After the intervention, the average English grade was higher than the students' average NGA; this was not the case prior to the intervention. Table 4.8 breaks down grade point average, as well as NGA, by student to emphasize the numerical change from pre- to post-

intervention assessment. Students 1, 6, and 7 increased both their GPA and NGA after completing the reading intervention. Student 2 increased their GPA while slightly decreasing their NGA. Student 3 did not have pretest data available because grades from junior high did not transfer into the high school data system. Student 3 had a passing NGA. Students 4 and 5 both decreased their GPA and NGA; however, they had highest GPA and NGA scores prior to the intervention.

The researcher believes that the intervention had a larger impact of students' performance in English class because English requires the highest amount of reading of all subjects. While all core classes require a level of reading, academic vocabulary greatly affects understandability of what students are reading in other classes including science, social studies, and math (Mokhtari & Velten, 2015). The researcher believes that the advanced academic vocabulary limited the students grade improvements post intervention.

Table 4.7

Posttest Data– Grades

Student	GPA	NGA	English Class Grade
1	2.28	86.71	82
2	1.16	56.83	75
3	1.57	74	80
4	2.57	81.42	88
5	3.0	83.57	80
6	2.29	76.57	75
7	3.14	85	89

Table 4.8

Posttest Data– GPA and NGA

Student	Pretest GPA	Posttest GPA	Pretest NGA	Posttest NGA
1	2.14	2.28	75.71	86.71
2	.57	1.16	57.43	56.83
3	Data Not Available	1.57	Data Not Available	74
4	3.14	2.57	86.29	81.42
5	3.28	3.0	88	83.57
6	1.14	2.29	66.85	76.57
7	2.43	3.14	81.86	85

Table 4.9 presents students' English grades. English classes require an increased level of reading and are more affected by a reading intervention program than other courses. Pre-intervention, two students had failed their English class and had not earned credit for that subject. Upon completion of the intervention, all students improved their English grades, passed their classes, and received credit. The average English grade prior to the reading intervention was 72; the average English grade post-intervention was 81.29, representing an increase of nearly 10 percentage points. There was also a significant increase in English grade from pretest (M = 72.00, SD = 11.82) to posttest (M = 81.29, SD = 5.59, z = 2.03, p = .04).

Table 4.9

Posttest Data– English Grades

Student	Pretest English Grade	Posttest English Grade
1	78	82
2	59	75
3	Data Not Available	80
4	74	88

5	80	80
6	56	75
7	85	89

Personal Reading Evaluation

Post-intervention, each student completed the same personal reading evaluation again with two questions gathering data for the second research question. Table 4.10 presents students' post-intervention answers to the question "How would you describe yourself as a reader?" Six of the students (the majority) answered positively, while only one answered negatively, as opposed to the pretest where three students answered negatively, three answered positively, and one provided a neutral answer.

Table 4.10

Question 1, Post-intervention

Student	Answer	Positive/Negative Answer
1	"OK I guess"	Positive
2	"Normal reader for my age"	Positive
3	"Doing pretty good at reading"	Positive
4	"I feel good about reading I read better now"	Positive
5	"Like I don't have a problem"	Positive
6	"I feel good about myself"	Positive
7	"Not good"	Negative

The students also re-answered the question "Do you enjoy reading?" (see Table 4.11). Pre-intervention, four students answered negatively and only three answered positively. Post-intervention, three students answered negatively and four answered positively. The answers "if it is something I like to read" and "it depends on the book"

were deemed positive answers because they listed instances in which the students did enjoy reading.

Table 4.11

Question 2, Post-intervention

Student	Answer	Positive/Negative Answer
1	"No I don't like it"	Negative
2	"If it is something I like to read"	Positive
3	"Nope"	Negative
4	"It depends on the book"	Positive
5	"I'm not really into it"	Negative
6	"Yes because I am really good at it"	Positive
7	"I like reading"	Positive

Analysis of Data

Table 4.12 illustrates the statistical data analysis for all quantitative data sets.

Table 4.12

Statistical Data Analysis

Variable	**Pretest**			**Posttest**			**Wilcoxon Signed Rank**	
	N	Mean	*SD*	*N*	Mean	*SD*	*Z*	*p*-value
Lexile	7	266.43	143.50	7	446.86	128.60	2.37	.02
GPA	6	2.12	1.08	7	2.29	0.72	1.15	.25
NGA	6	76.02	11.94	7	77.73	10.27	.52	.60
English Grade	6	72.00	11.82	7	81.29	5.59	2.03	.04

Research Question 1

Research Question 1 addressed the impact the reading intervention, System 44™, had on students' Lexile levels. The pretest and posttest Student Reading Inventory (SRI) determined the students' Lexile levels before and upon completing the reading intervention. The Wilcoxon signed-rank test determined if the increase in Lexile level was statistically significant. The Wilcoxon signed-rank test is the nonparametric equivalent of a paired sample t-test. It was chosen because the data are not normally distributed (see Figure 4.1) and because the sample size was small. The results of the Wilcoxon signed-rank test revealed a significant increase in Lexile scores from pretest (M = 266.43, SD = 143.50) to posttest (M = 446.86, SD = 128.60, z = 2.37, p = .02). The low p-value indicated strong evidence of a null-hypothesis and supported the answer that the reading inventory had a positive effect on students' overall Lexile levels.

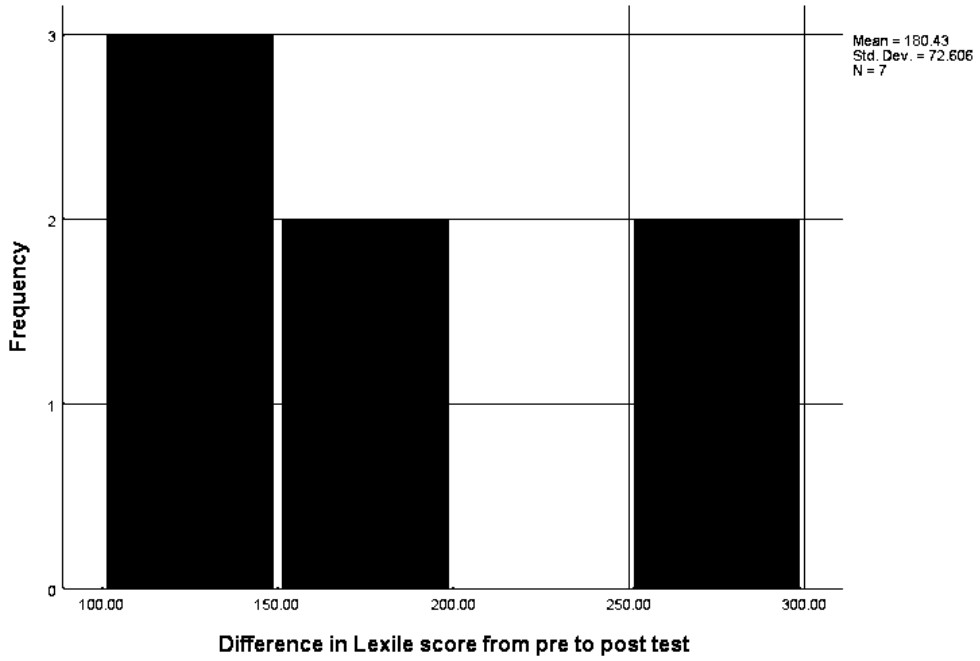

Figure 4.1. Histogram Lexile Score.

Subquestion 1

The first sub-question aimed to determine if the intervention had a positive impact of students' GPA, NGA, and grades in English class. Compilation of these data sets occurred the semester prior to receiving the intervention and upon completion of the intervention statistical analysis occurred to determine the impact of the intervention on all three categories (see Figures 4.2–4.4). There was also a significant increase in English grade from pretest (M = 72.00, SD = 11.82) to posttest (M = 81.29, SD = 5.59, z = 2.03, p = .04). While individual students showed improvement in overall NGA and GPA post-intervention, there was no statistical change in GPA (z = 1.15, p = .25, or in NGA, z = .52, p = .60; see Table 4.12).

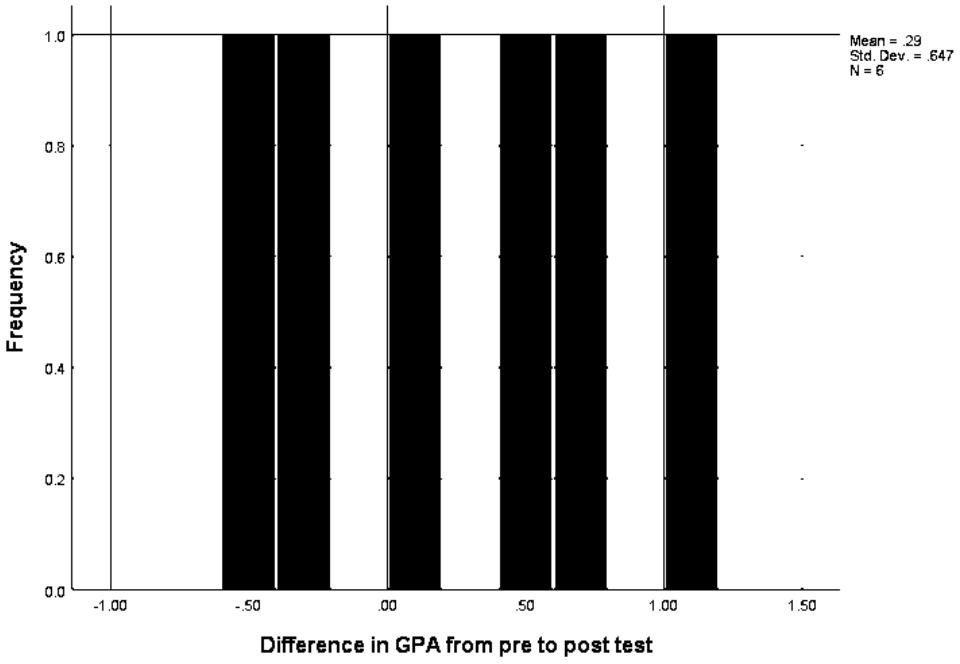

Figure 4.2. Histogram GPA.

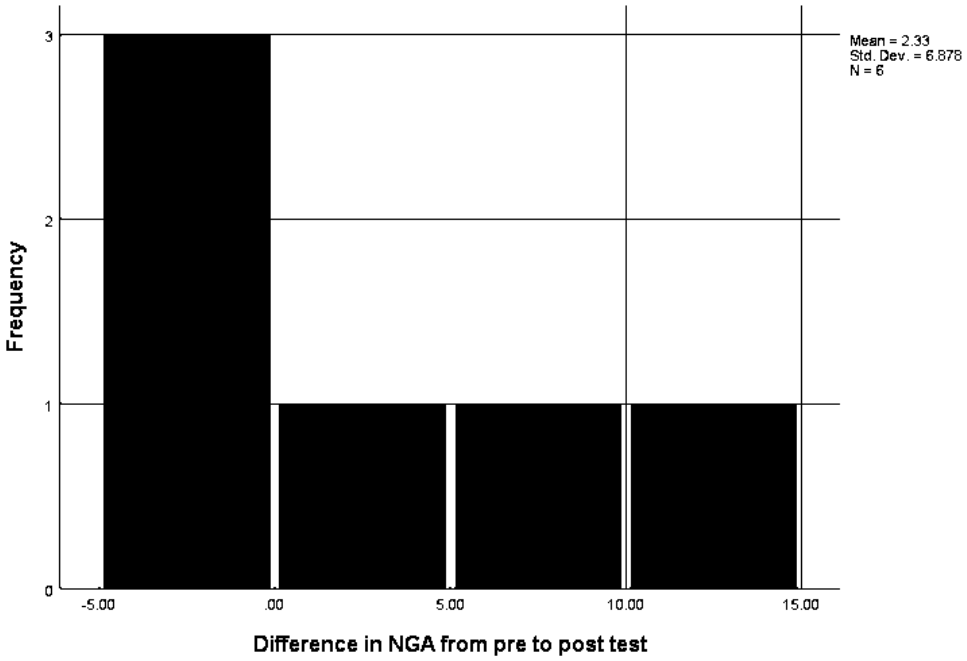

Figure 4.3. Histogram NGA.

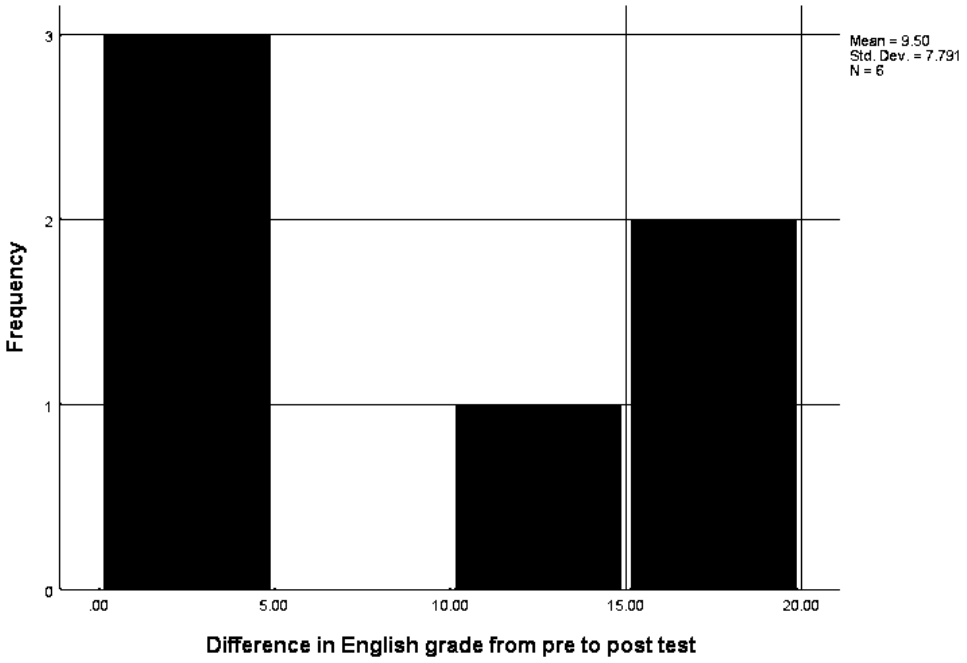

Figure 4.4. Histogram English Grades.

Subquestion 2

The second research question looked at the potential correlation between the completion of the intervention and student attitudes toward reading and self-perception as readers. The answers from two questions on the questionnaire addressed this aspect. In response to the question, "How would you describe yourself as a reader?" the number of positive answers increased after the intervention to six of the seven students questioned compared to prior to the intervention when only three students had a positive answer. The intervention lead to three of the seven students having a change in their self-perception as a reader from negative to positive.

In response to the second question, "Do you enjoy reading?" upon completion of the intervention four students answered the question positively where only had three answered positively prior to receiving the intervention. The intervention lead to one additional student answering positively that they do enjoy reading. In total at the end of the intervention, four of the seven students stated enjoyed reading.

None of the students who answered positively pre-intervention answered negatively to either question post-intervention. The intervention had a positive effect on both the students' self-perception as readers and their enjoyment of reading as a whole based on the increased number of positive responses to both questionnaire questions post-intervention.

Summary

Quantitative and qualitative data sets were collected in a pretest-posttest format to answer the research question and two sub questions. The SRI determined each student's Lexile level, which answer research question one. The data stated that the reading

intervention did have a positive impact on the students Lexile levels. Students' overall GPA, NGA, and English grades were compiled in the same pretest/posttest format to determine if the reading intervention had a positive impact on students' overall outcomes. This answered the first sub questions, while overall there was improvement in all categories, the only area that was statistically significant was in the area of English grades. Qualitative data, via the questionnaire, determine whether the completion of the intervention had a positive impact on attitudes about reading and self-perception. Students answered two questions: "How would you describe yourself as a reader?" and "p?" After the intervention was completed more students answered positively to each question than prior to the intervention.

CHAPTER 5 – SUMMARY

Introduction

Chapter 5 provides a summary of the research study, overview of findings, and recommendations for future studies. This action research study addressed the problem of practice that students in special education at the high school level were reading significantly below their current grade level. Prior to this action research study, no reading intervention existed for the special education students at HHS. The problem was confirmed when all students in special education, who received academic support in English, were given an assessment to determine their current Lexile level. Creation of the Fundamentals of Reading class occurred after presenting the aforementioned data to the district, and the teacher-researcher implemented System 44™ as the curriculum for the reading intervention.

Selection for the Fundamentals of Reading class and subsequently participation in the action research study occurred based on current Lexile level and cognitive ability. If a students' current reading ability was commensurate with their cognitive ability, they were excluded from the reading intervention class. The curriculum for the intervention was System 44™, which includes three components: small-group instruction individualized computer-based instruction, and independent reading.

The action research study took place one per day for 50 minutes over the course of one semester (18 weeks). The first three weeks of the intervention focused on student acquisition of the System 44™ procedures and structure. The remainder of the study

implemented the intervention, which exclusively utilized System 44™ curriculum focused on word decoding, fluency, and reading comprehension.

Research Questions

This study aimed to determine what effect a structured, individualized reading intervention course would have on the reading abilities of high school students receiving special education services. One research question with two sub questions were posed: How would such an intervention affect Lexile levels of such students? Subquestion 1: How would such an intervention affect the grades, and specifically English grades of such students? Subquestion 2: How would the progress of such students through such an intervention relate to their feelings about reading and their overall self-confidence as it pertained to reading?

Purpose of the Study

This purpose of the study was to ascertain the effects System 44™ reading instruction had on high school students in special education at HHS. Students in the study had a variety of disabilities. System 44™ was designed to improve students' reading through individual, self-paced, computer-based instruction; small-group instruction led by the teacher-researcher; and full-class warm-ups. The program focused on students' individual needs, including decoding sounds and words, reading fluency, and reading comprehension. Success of the intervention was measured by an increase in the students' Lexile levels. Students' Lexile levels were determined through assessment before and after the intervention and compared to see if the intervention had increased the students' reading abilities. Corresponding improvements in the students' grades and personal attitude towards reading also measured success.

Summary of the Results

Success of the study was determined through three measures that corresponded to the three research questions. The first measure was the effect the reading intervention, System 44™, had on students' Lexile levels. Prior to beginning the intervention, all students participating in the study completed the SRI to determine their starting Lexile levels. After completion of the intervention, 18 weeks later, the students retook the SRI. Lexile levels were recorded in a pretest/posttest manner, both in terms of the measure of central tendency and in terms of individual performance. The mean Lexile level increased by 180.43 points after the students completed the intervention. The conversion of Lexile level to reading level equated to a starting average reading level of Grade 1.7; upon completion of the intervention, the average reading level equated to a grade level of 2.5. Each student's Lexile Level also increased; increases ranged from 108 to 282 points. The statistical analysis indicated a p-value of .02 demonstrating the strong correlation between reading intervention and students' Lexile level.

The second measure aimed to determine the impact of the intervention on student grades. One of the students was not included because his grades from middle school did not transfer to the high school data system. Upon completion of the reading intervention, the mean for all six remaining students' GPA and NGA increased; likewise, the average grade in the students' English class improved by nearly 10 percentage points. Examined individually, four of the students showed an increased GPA and NGA upon completion of the intervention. Five of the students improved their individual grades in English, while the sixth student had the same English grade prior to and upon completion of the intervention. A Wilcoxon signed-ranked test evaluated the data. While the changes in

English grades were statistically significant, the changes in overall grades and GPA were not. A p-value of .04 for English grades represented a positive correlation with the intervention.

The third and final measure of success in this study addressed the third research question and the relationship between the completion of the reading intervention and student attitudes and self-impressions. All students completed a questionnaire prior to and upon completion of the intervention. All answers were deemed positive, negative, or neutral. Prior to the intervention, only three students answered positively when asked to describe themselves as readers; post-intervention, six students answered positively. Prior to the intervention, only three students answered in a positive manner when asked if they enjoyed reading; following the intervention, four students had a positive answer.

Results Related to Current Literature

Findings from this action research suggest that high school students in special education can demonstrate improvements in their reading abilities after receiving carefully designed reading intervention. Previous studies have indicated this as well (Kim, Vaughn, & Klinger, 2006). The reading intervention conducted in the action research study, System 44™, had three components: computer-based instruction, small-group instruction, and independent reading. The first component addressed is computer-based instruction.

Cazzell et al. (2016) conducted a study for high school students with intellectual disabilities using a computer; that study worked on voice recognition with a computer-based flash card system and focused on students with intellectual disabilities. The study proved successful; “each student showed an increase in word reading acquisition after the

intervention was applied" (Cazzell et al., 2016, p. 199). While the current study used a different computer-based intervention method, it also demonstrated that reading interventions with a computer-based component can be successful for students with disabilities.

Kim, Vaughn, and Klinger (2006) also completed a reading intervention study regarding students with disabilities that incorporated a computer-based component. Their study used the computer program Computer Assisted Collaborative Reading Strategies; their reading intervention was applied in two 50-minute periods per week for 12 weeks. Kim et al. (2006) noted, "computer assisted instruction has the potential to offer students with LD self-paced, individualized instruction that includes immediate feedback and multiple opportunities for practice" (p. 236). Their study also demonstrated reading improvement for students with learning disabilities who completed the computer-based intervention. The data from the current action research study, as well as the two aforementioned studies, support the notion that reading intervention with a computer-based component is an effective intervention for students with disabilities.

The second component of System 44™ was teacher-led, small-group instruction. This component too has proven effective for students in special education, both in the current action research study as well as in other studies previously conducted. Hall and Burns (2018) evaluated 26 reading interventions to assess the value of small-group instruction as part of a reading intervention. They determined that, "this meta-analysis adds to the current research demonstrating that small-group reading interventions are effective" (Hall & Burns, 2018, p. 65). Vaughn et al. (2015) also completed a reading intervention study for high-school-aged students with significant reading deficits. Their

intervention was provided in a small group setting in 50-minute periods. Their study concluded that providing reading intervention in teacher-led, small groups "was effective in improving students' reading comprehension" (Vaughn et al., 2015, p. 554). These studies demonstrated success improving reading comprehension through small-group instruction is corroborated by the findings of the present action research study.

The final component of System 44™ was the independent reading and assessment component. Students selected a book at their independent reading level, read the book, completed a graphic organizer, and took an online assessment covering what they had just read. Kolski and Mingyuan (2017) examined the effects that independent reading has on students' overall reading ability. The authors noted that "being provided time at least "often" to read in the classroom showed to positively impact the reading achievement scores compared to the scores of students who were not provided time for independent reading" (Kolski & Mingyuan, 2017, p. 74). The present study's weekly intervention design allowed for a 50-minute class period each week devoted solely to students' silent, independent reading; this component contributed to the improved reading abilities found upon completion of the intervention.

The combination of all three components of the System 44™ reading program comprising the present study's intervention led to demonstrated improvement in the reading abilities of students in special education. This improvement was demonstrated through improved Lexile levels as well as improved GPA and English class grades. This study also examined the relationship between students' reading ability and their attitudes and self-perceptions. Completion of the intervention improved overall attitudes of the

students in terms of reading and positively altered their perception of themselves as readers.

Implications of the Study

The positive results of this action research study provide several implications for future interventions. The study proves there is a need and benefit for high school level reading remediation. Broader implications require looking at other knowledge gaps for high school students in special education and providing appropriate intervention for those subjects. Potential subjects for intervention would include basic math, problem solving skills, communication abilities, and independent living skills. This study provides that high school is not too late to provide intervention and that it can be successful for students at that level.

Action Plan

This action research study illustrated that System 44™ had a positive impact on high school students in special education's reading abilities. This was specifically demonstrated through improved Lexile level, overall grades, grades in English classes, and increased self-perception as readers. Outlined below is a four-part action plan illustrate the next steps with the aim of improving upon and growing the reading intervention program for high school students in special education. Additionally, future policy and research implications are discussed.

The results of this study support the conclusion that reading intervention at the high school level for students in special education can be effective. Based on these findings, the teacher-research developed an action plan comprising four tasks: (a) compose data to present to students, parents, teachers, and district personnel with the aim

of expanding reading intervention at the high school level; (b) increase student engagement; (c) continue to gather data on incoming students to determine the need for reading intervention; and (d) monitor students currently receiving the reading intervention to ensure progress and retention of material.

Action Step 1: Comprise Data for Continued Intervention

The first action step is to compile and routinely share data with all involved parties aiming to continue and grow the reading intervention program for high school students in special education. Sharing of data supporting the success of reading intervention at the high school level with district personnel who make decisions about intervention programs and allocated at the campus level will occur. These data will include students' increased Lexile levels, overall grades, and grades in English to prove that the System 44™ intervention positively affects students' success in all classrooms. Parents and guardians will also receive data that demonstrates student improvement in reading and all grades. Informing parents and students of their success and improvement facilitates celebration of student accomplishments, positive reinforcement, and increased student motivation.

Action Step 2: Increase Student Engagement

During the action research period, the students became bored with the monotony of the program schedule as well as the seemingly slow progression through the online component of the curriculum. This will be remedied by allowing students to track their progress to facilitate student awareness of the gains they are making in their reading ability with the aim to increase student motivation. Implementation of an overall classroom rewards or token-economy systems to help encourage the students to continue

working hard to improve their individual reading skills. Additionally, classroom celebrations when students achieve predetermined scores on assessments and complete online modules will occur.

Action Step 3: Gather Data on Incoming Students

With the goal of growing the reading intervention program, new students need to be evaluated to determine if the need is present for reading intervention. Students in special education transferring into the district, no matter their current grade level, will receive a reading evaluation to determine and place students correctly in the reading intervention program. This process will also occur for current and incoming ninth graders to provide intervention for all students who require it.

Action Step 4: Monitor Students Currently Receiving Intervention

The final step of the action plan is to continue to monitor students who are currently receiving intervention to ensure their continued progression in reading as well as to monitor the estimated completion of data in the intervention. Continuously monitoring those receiving reading intervention is essential to ensure progression in reading skills. If students are not progressing, further research needs to be conducted to determine the reason for lack of progression and the appropriate next steps for that individual student. Possible reasons for lack of progression, according to the teacher-research, include lack of motivation, lack of teacher support, and lack of cognitive ability. Action Step 2 addresses potential remedies for lack of student motivation. If a student or small group of students in the classroom are particularly disengaged in the intervention, individualized plans will be implemented to facilitate student engagement in the intervention. For students who are not progressing due to cognitive ability, it will be

determined on an individual basis if reading intervention is appropriate for that student based on their cognitive ability and diagnosed disability.

Determination for students continuing to receive reading intervention instruction was determined on an individual basis for all students. Due to the individualized nature of disabilities, a set growth goal was not implemented for all students receiving intervention. Factors that were included in determining students' potential continuation in the reading intervention included, past progress or lack thereof, current credit needs in accordance with graduation, students' individual disabilities, and cognitive capabilities.

Summary

The overall aim of this action research study was to prove the effectiveness of System 44™ reading intervention at the high school level for students in special education. This action research study proved the success of this program through growth in students' Lexile level and increased grades and self-perception of the students as readers. The implementation of a reading intervention class at HHS will continue with the hope of expanding the number of classes and high school campuses that offer this intervention.

Recommendations for Policy and Practice

The teacher-researcher recommends not only the continuation of the reading intervention class for students in special education, but also an expansion in the number of classes offered at this and other high schools. This action research study demonstrated that students at the secondary level can make improvements in their reading skills when provided proper intervention. For this reason, more special education students at the high school level need to receive this intervention. The teacher-researcher also recommends

pushing the intervention down to the middle-school level with the goal of providing earlier intervention to an increased number of students. Successful intervention in earlier grade levels could reduce the need for high school reading intervention programs.

Recommendations for Future Research

Limits to the present study include sample size, time constrains, student engagement, and limited disability diagnoses. The following four suggestions for future research aim to expand the findings of this action research study.

1. A sample size of seven is a major limitation of this research study. Six of the students were male and only one participant was female. Future research should include a larger and more diverse group of students to increase generalization of the study to across different student groups.
2. Due to scheduling and teacher allocations, the teacher-researcher only conducted the intervention for 18-weeks. Future research should be conducted over a longer period to note longitudinal improvements in students' reading ability. Future studies should also examine student retention after the intervention aiming to determine if students retain the skills acquired during the reading intervention.
3. Lack of student engagement was an issue in the success of the reading intervention. Reading intervention requires a very structured format to include all necessary components; unfortunately, this can feel redundant and lead to students' lack of engagement, motivation, and full effort from being applied to their learning. Further research should determine specific strategies and

aspects to incorporate into a structured reading intervention to improve student engagement.

4. Students in special education have a large spectrum of disabilities, cognitive levels, and ability levels. This research study included four disability types; specific learning disability, speech impairment, auditory impairment, and other health impairment. Future research should include additional disability types or limited to a sample group of students with the same diagnosed disability. This would facilitate increasingly accurate data on how certain populations of students respond to the intervention.

Implications for Theoretical Framework

The theoretical framework for this action research focused on progressivism and reading motivation theory (RMT). Progressivism focuses on the teachings of Dewey, who believed that the world was ever changing and that education should be changing and adapting with it (Bruce, 2013). Dewey believed that students should be engaged in their education because curriculum is founded in personal experience and connected to life. In a reading classroom, this entails selecting text that has meaning to the students and demonstrating the importance of reading in their lives and future goals. While System 44™ did provide a variety of books to read, the selection was not always engaging to the students, which led to lack of engagement and motivation. More flexibility would increase student engagement and follow more closely with the principles of progressivism outlined by Dewey (Bruce, 2013). Similarly, reading motivation theory focuses on the following three questions: Can I be a good reader, do I want to be a good reader, and how can I become a good reader? System 44™ provides

the answer to the third and final question but skips over the first two. Future research should focus on how to incorporate the first two questions into the beginning of a reading intervention program in order to increase student engagement and motivation.

Conclusion

This action research study aimed to determine the effect that a specific reading intervention program, System 44™, had on special education students in high school. The study specifically noted improvement in student Lexile levels, classroom grades, English grades, attitudes toward reading, and self-perception as readers. The intervention was successful on all accounts. Overall, students demonstrated increasingly positive feelings about reading and themselves as readers. These results are consistent with other research conducted about reading intervention programs. This program consisted of three components: independent, computer-based instruction; small group, teacher-led instruction, and independent reading. Current research has demonstrated that these components lead to improved reading abilities in students with disabilities.

The teacher-researcher created an action plan that includes presenting data to important parties, trouble-shooting issues that arose during the research, and researching programs for future reading intervention. The teacher-researcher also suggests that, based on the success of this action research study, reading intervention programs expand, both at this high school and at high schools in the district. Recommendations for future research involve examining intervention programs offering high levels of student engagement in order to facilitate better student motivation and success

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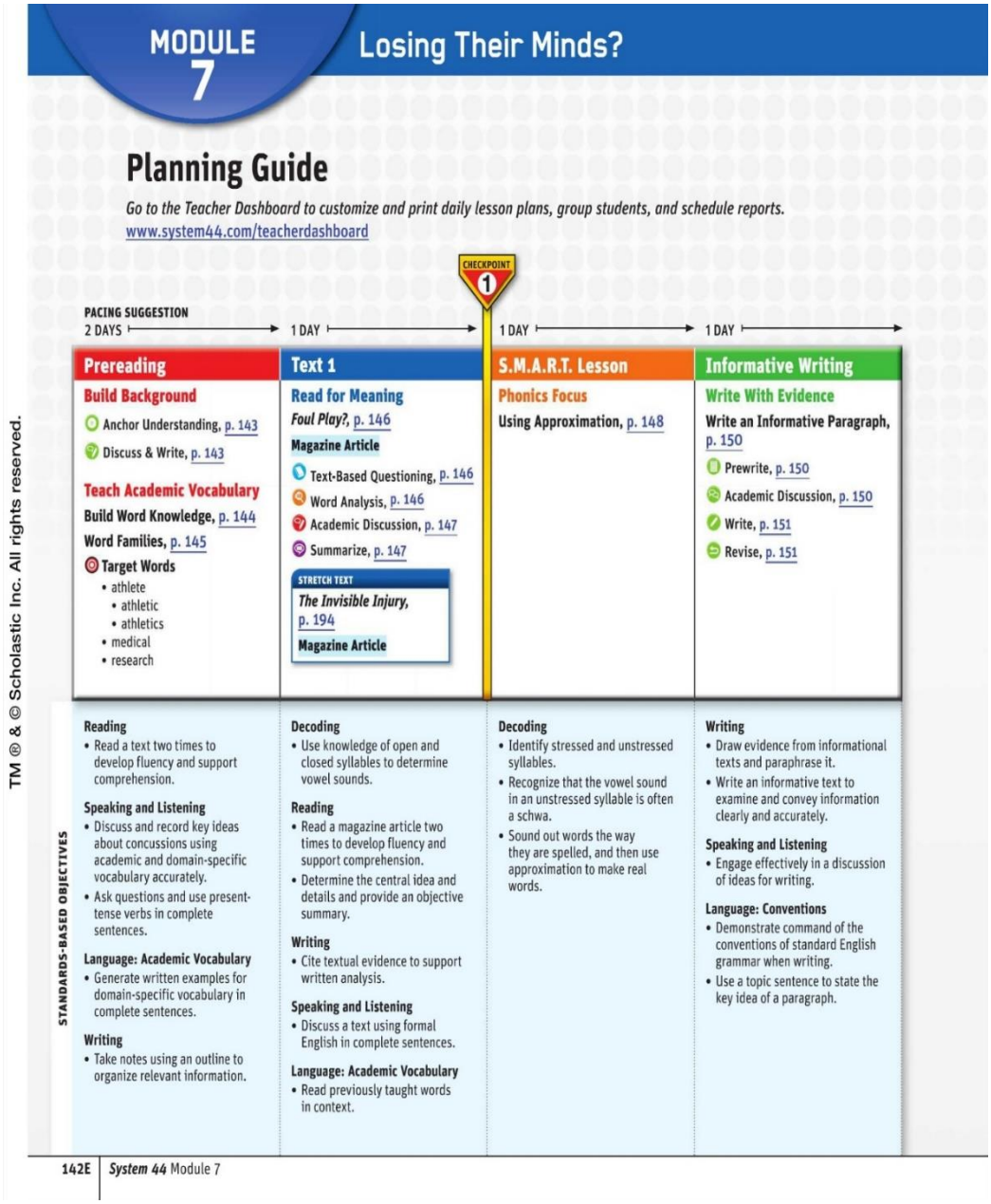
APPENDIX A: SAMPLE LESSON PLANS



MODULE 7 Losing Their Minds?

Planning Guide

Go to the Teacher Dashboard to customize and print daily lesson plans, group students, and schedule reports.
www.system44.com/teacherdashboard

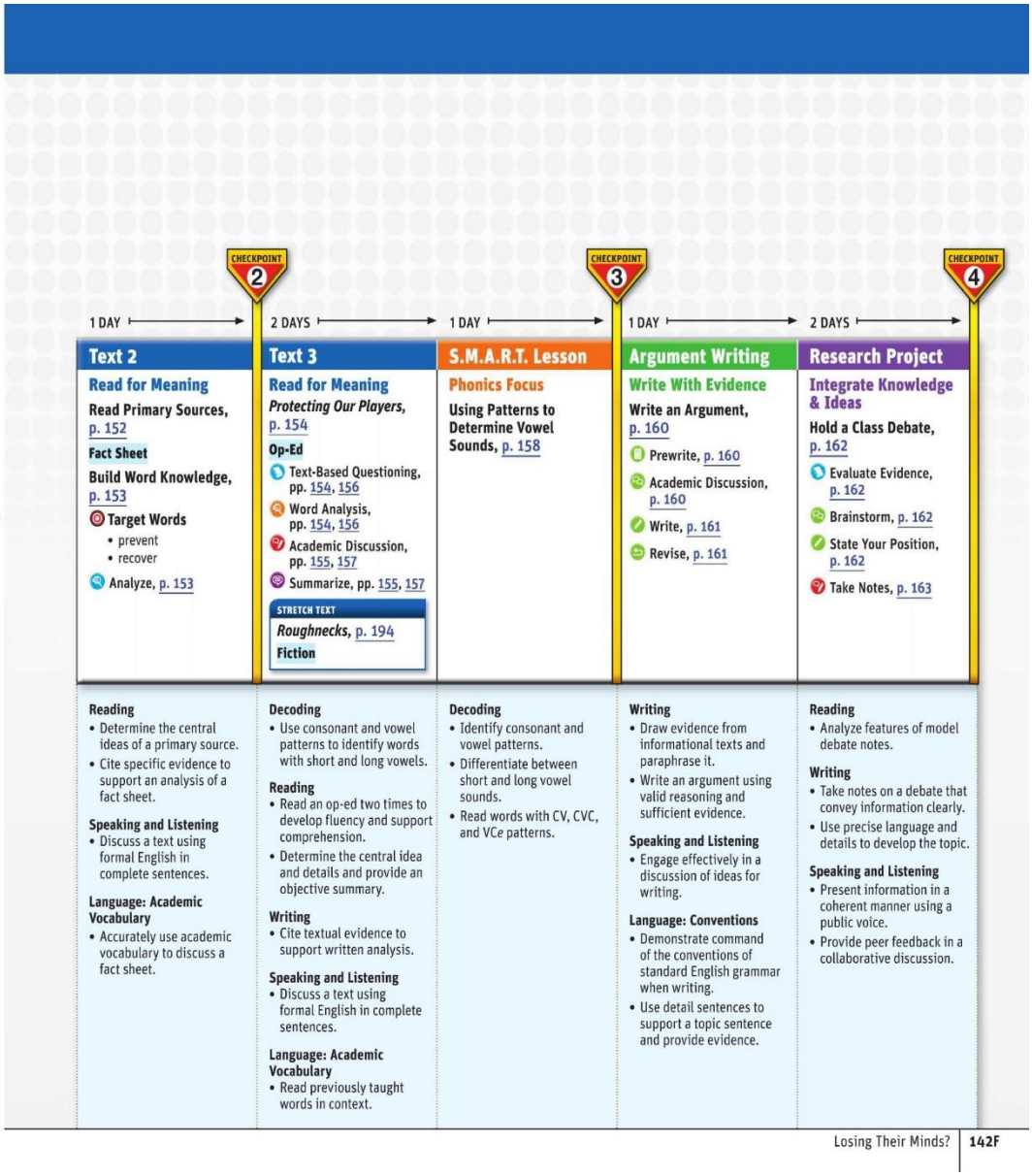
CHECKPOINT 1

PACING SUGGESTION: 2 DAYS → 1 DAY → 1 DAY → 1 DAY

Prereading	Text 1	S.M.A.R.T. Lesson	Informative Writing
Build Background Anchor Understanding, p. 143 Discuss & Write, p. 143 **Teach Academic Vocabulary** Build Word Knowledge, p. 144 Word Families, p. 145 Target Words • athlete • athletic • athletics • medical • research	**Read for Meaning** *Foul Play?*, p. 146 Magazine Article Text-Based Questioning, p. 146 Word Analysis, p. 146 Academic Discussion, p. 147 Summarize, p. 147 STRETCH TEXT *The Invisible Injury*, p. 194 Magazine Article	**Phonics Focus** Using Approximation, p. 148	**Write With Evidence** Write an Informative Paragraph, p. 150 Prewrite, p. 150 Academic Discussion, p. 150 Write, p. 151 Revise, p. 151

STANDARDS-BASED OBJECTIVES

Reading • Read a text two times to develop fluency and support comprehension. **Speaking and Listening** • Discuss and record key ideas about concussions using academic and domain-specific vocabulary accurately. • Ask questions and use present-tense verbs in complete sentences. **Language: Academic Vocabulary** • Generate written examples for domain-specific vocabulary in complete sentences. **Writing** • Take notes using an outline to organize relevant information.	**Decoding** • Use knowledge of open and closed syllables to determine vowel sounds. **Reading** • Read a magazine article two times to develop fluency and support comprehension. • Determine the central idea and details and provide an objective summary. **Writing** • Cite textual evidence to support written analysis. **Speaking and Listening** • Discuss a text using formal English in complete sentences. **Language: Academic Vocabulary** • Read previously taught words in context.	**Decoding** • Identify stressed and unstressed syllables. • Recognize that the vowel sound in an unstressed syllable is often a schwa. • Sound out words the way they are spelled, and then use approximation to make real words.	**Writing** • Draw evidence from informational texts and paraphrase it. • Write an informative text to examine and convey information clearly and accurately. **Speaking and Listening** • Engage effectively in a discussion of ideas for writing. **Language: Conventions** • Demonstrate command of the conventions of standard English grammar when writing. • Use a topic sentence to state the key idea of a paragraph.



MODULE 7

TEXT 1 Magazine Article

READ | TALK | WRITE

Student Objectives

Content Goals
- Read a magazine article two times to develop fluency and support comprehension.
- Cite evidence to support written analysis.
- Determine the central idea and details of a text and provide an objective summary.

Language Goals
- Discuss a text using formal English in complete sentences.
- Use knowledge of open and closed syllables to determine vowel sounds.

Do Now

During Whole-Group Introduction, have partners sort words that begin with open and closed syllables:

Sort these words into two categories: Words That Begin With Open Syllables and Words That Begin With Closed Syllables.

- *bacon*
- *basket*
- *laptop*
- *legal*
- *seven*
- *silent*
- *ticket*
- *traffic*

Share responses with **RED Routine 5:** Idea Wave.

Text-Based Questioning

During Small-Group Instruction, read "Foul Play?"

1st READ **Read** the article title and photo caption. Set a purpose for reading: *Let's read to find out how concussions can affect athletes' brains.* Build fluency with Modeled Fluent Reading.

- Explain Words to Know in context.

Read each Comprehension and Vocabulary & Language question aloud and guide students to respond.

- **Read Closely** *The first paragraph explained why athletes should not return to sports too soon after a concussion. Let's reread it together.*
- **Interpret Evidence** Cue partners (1/2) to think about and share responses.
- **Communicate and Collaborate** Select students to report out. Direct students to write a response.

Word Analysis

Teach key concepts. *Sometimes I need to try different pronunciations and strategies to help me read new words.*

- Tell students that when they come to a new word, they can try splitting the syllables differently or stressing different syllables until the word sounds right. *Read the orange words out loud along with me.*
- Have partners circle the S.M.A.R.T. words with short vowel sounds in the first syllable and underline the words with long vowel sounds in the first syllable.

2nd READ **Reread** the article with Oral Cloze. *Follow along as I read aloud. When I leave out a word, chime in.*

TEXT 1
Magazine Article

Text-Based Questioning

Comprehension

1. Why should athletes heal from concussions before they return to sports?

Athletes should heal from concussions before returning to sports because playing too soon "can make the injury worse."

2. What is the purpose of the tests that Mater Dei football players take before and after concussions?

The purpose of the tests is to show whether players should return to the game.

Vocabulary & Language

3. How does the suffix *–ly* change the meaning of the adjective *serious* in paragraph 4?

The suffix changes *serious* to an adverb that describes how the department treats concussions.

Word Analysis

Circle S.M.A.R.T. words with short vowel sounds in the first syllable. Underline words with long vowel sounds in the first syllable.

Dr. Ann McKee runs the VA CSTE Brain Bank. Here, she cuts apart a brain.

FOUL PLAY?

by Rickie Cruz

¶1 Concussions are brain injuries. They are common in contact sports. Many **athletes** with concussions play again before their brains heal. That can make the injury worse.

¶2 What happens to athletes who suffer multiple concussions? At Boston University, the VA CSTE Brain Bank **researches** this question. Scientists there study deceased athletes' brains.

¶3 The scientists are finding that most of these athletes had Chronic Traumatic Encephalopathy (CTE). **Medical** research shows that multiple hits to the head cause CTE. This fatal brain disease causes dementia.

146 MODULE 7

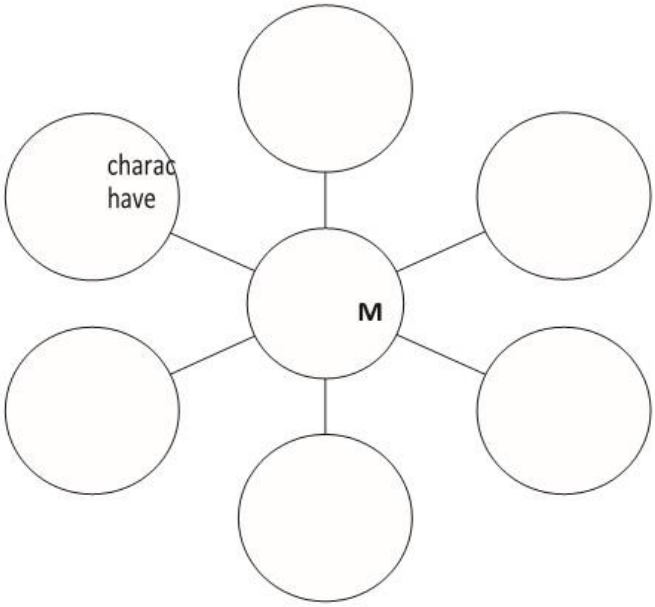
Bo

N

All About Anime

Build Understanding

Fill in the circles below with words or phrases that describe manga.



QuickWri

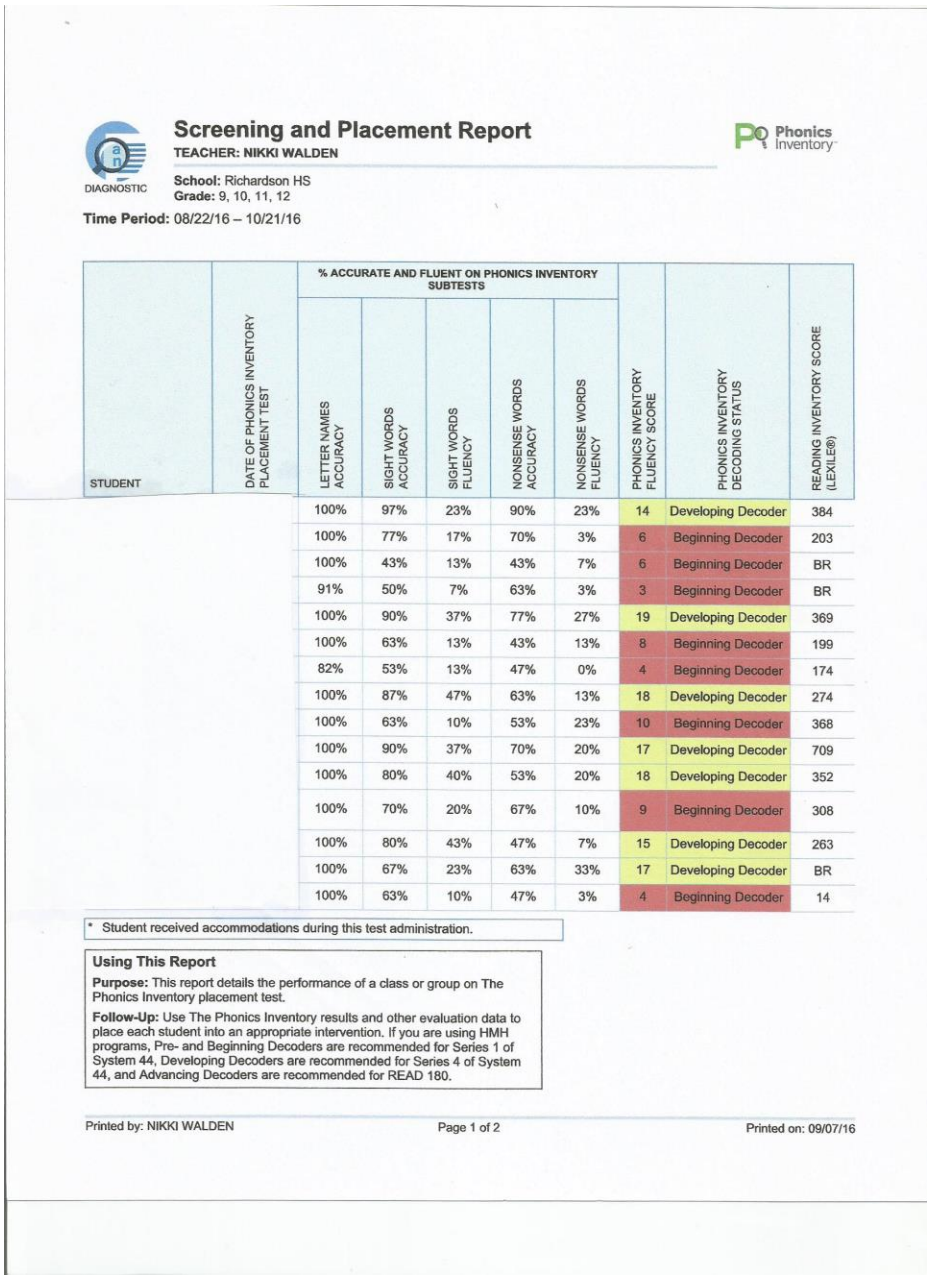
Create a manga character. Write about it.

Res
Library Teaching
All

U Library Teaching

The Comprehension

APPENDIX B: DATA COLLECTION



DIAGNOSTIC

Screening and Placement Report

TEACHER: NIKKI WALDEN

Phonics Inventory

School: Richardson HS
Grade: 9, 10, 11, 12

Time Period: 08/22/16 – 10/21/16

STUDENT	DATE OF PHONICS INVENTORY PLACEMENT TEST	% ACCURATE AND FLUENT ON PHONICS INVENTORY SUBTESTS					PHONICS INVENTORY FLUENCY SCORE	PHONICS INVENTORY DECODING STATUS	READING INVENTORY SCORE (LEXILE®)
		LETTER NAMES ACCURACY	SIGHT WORDS ACCURACY	SIGHT WORDS FLUENCY	NONSENSE WORDS ACCURACY	NONSENSE WORDS FLUENCY			
		100%	97%	23%	90%	23%	14	Developing Decoder	384
		100%	77%	17%	70%	3%	6	Beginning Decoder	203
		100%	43%	13%	43%	7%	6	Beginning Decoder	BR
		91%	50%	7%	63%	3%	3	Beginning Decoder	BR
		100%	90%	37%	77%	27%	19	Developing Decoder	369
		100%	63%	13%	43%	13%	8	Beginning Decoder	199
		82%	53%	13%	47%	0%	4	Beginning Decoder	174
		100%	87%	47%	63%	13%	18	Developing Decoder	274
		100%	63%	10%	53%	23%	10	Beginning Decoder	368
		100%	90%	37%	70%	20%	17	Developing Decoder	709
		100%	80%	40%	53%	20%	18	Developing Decoder	352
		100%	70%	20%	67%	10%	9	Beginning Decoder	308
		100%	80%	43%	47%	7%	15	Developing Decoder	263
		100%	67%	23%	63%	33%	17	Developing Decoder	BR
		100%	63%	10%	47%	3%	4	Beginning Decoder	14

* Student received accommodations during this test administration.

Using This Report

Purpose: This report details the performance of a class or group on The Phonics Inventory placement test.

Follow-Up: Use The Phonics Inventory results and other evaluation data to place each student into an appropriate intervention. If you are using HMH programs, Pre- and Beginning Decoders are recommended for Series 1 of System 44, Developing Decoders are recommended for Series 4 of System 44, and Advancing Decoders are recommended for READ 180.

Printed by: NIKKI WALDEN Page 1 of 2 Printed on: 09/07/16

Name: _____

System 44 Self-Monitoring Chart

Use this chart to track your progress in *System 44*. Fill in the circle when you finish a Topic. Then find the related practice activities and mark a check after you complete each one.

	Software Topic	○	*44Book*	✓	*Decodable Digest*	✓	Paperback/Audiobook	✓	Xtra Collection	✓	Check-In
SERIES 1	**1.1** Consonants *m, s*	○	p. 8		pp. 9–10		Book 1		Fact & Fiction Books 1–2 Content-Area Books 1–2		
	1.2 Consonants *t, n*	○	p. 9		pp. 11–12						
	1.3 Short *a*	○	p. 10		p. 13						
	1.4 Consonants *p, c*	○	p. 11		pp. 14–15						
	1.5 Consonants *b, r*	○	p. 12		pp. 16–17						
	1.6 Sight Words	○	p. 13				Book 2				
	1.7 Ending *–s*	○	p. 14		p. 18						
	1.8 Success	○	p. 15								
SERIES 2	**2.1** Short *i*	○	p. 16		p. 19		Books 1–2		Fact & Fiction Book 2 Content-Area Book 3		
	2.2 Consonants *d, f*	○	p. 17		pp. 20–21						
	2.3 Consonants *h, k*	○	p. 18		pp. 22–23						
	2.4 Short *o*	○	p. 19		p. 24						
	2.5 Consonants *l, x*	○	p. 20		pp. 25–26						
	2.6 *–ck*	○	p. 21		p. 27						
	2.7 Sight Words	○	p. 22								
	2.8 Success	○	p. 23								
SERIES 3	**3.1** *s-* Blends	○	p. 24		p. 28		Book 3		F & F Book 3; CA Book 4		
	3.2 Short *e*	○	p. 25		p. 29				Fact & Fiction Book 2 Content-Area Book 3		
	3.3 Consonants *j, w*	○	p. 26		pp. 30–31						
	3.4 Short *u*	○	p. 27		p. 32						
	3.5 Consonants *g, y*	○	p. 28		pp. 33–34						
	3.6 Consonants *v, z, q*	○	p. 29		pp. 35–37						
	3.7 Sight Words	○	p. 30								
	3.8 Success	○	p. 31								
SERIES 4	**4.1** More *s-* Blends	○	p. 32		p. 38		Books 4–5				
	4.2 Double Consonants	○	p. 33		p. 39				Content-Area Book 4		
	4.3 Final Blends	○	p. 34		p. 40		Book 6				
	4.4 Identifying Syllables	○	p. 35		p. 41				Fact & Fiction Books 3–4 Content-Area Book 5		
	4.5 Sight Words	○	p. 36								
	4.6 Success	○	p. 37								
SERIES 5	**5.1** *l-* Blends	○	p. 38		p. 42		Books 4–5		Fact & Fiction Book 4		
	5.2 *r-* Blends	○	p. 39		p. 43						
	5.3 More *l-* and *r-*	○	p. 40		p. 44						
	5.4 Two- and Three-Letter Blends	○	p. 41		p. 45						
	5.5 Sight Words	○	p. 42								
	5.6 Success	○	p. 43								
SERIES 6	**6.1** More Final Blends	○	p. 44		p. 46		Books 4, 6		Fact & Fiction Book 4		
	6.2 *–ng* and *-nk*	○	p. 45		p. 47						
	6.3 Closed Syllables	○	p. 46		p. 48		Book 7		F & F Book 5; C-A Book 5		
	6.4 *–nt* and *-nd*	○	p. 47		p. 49		Books 4, 6				
	6.5 Sight Words	○	p. 48								
	6.6 Success	○	p. 49				Books 4, 6–7				

Resource Link

Personal Reading Evaluation

1. When asked to read in class how do you feel?

_____

_____

_____

2. How would you describe yourself as a reader?

_____

_____

_____

3. Do you enjoy reading? Why or why not?

_____

_____

_____

4. What type of things do you like to read?

_____

_____

_____

5. What about reading do you struggle with?

_____

_____

_____

6. What part about reading are you the best at?

_____

_____

_____

7. Why would you like to improve your reading abilities?

_____

_____

_____